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THE INDIAN SEAFOOD EXPORTERS ASSOCIATION
COCHIN-2

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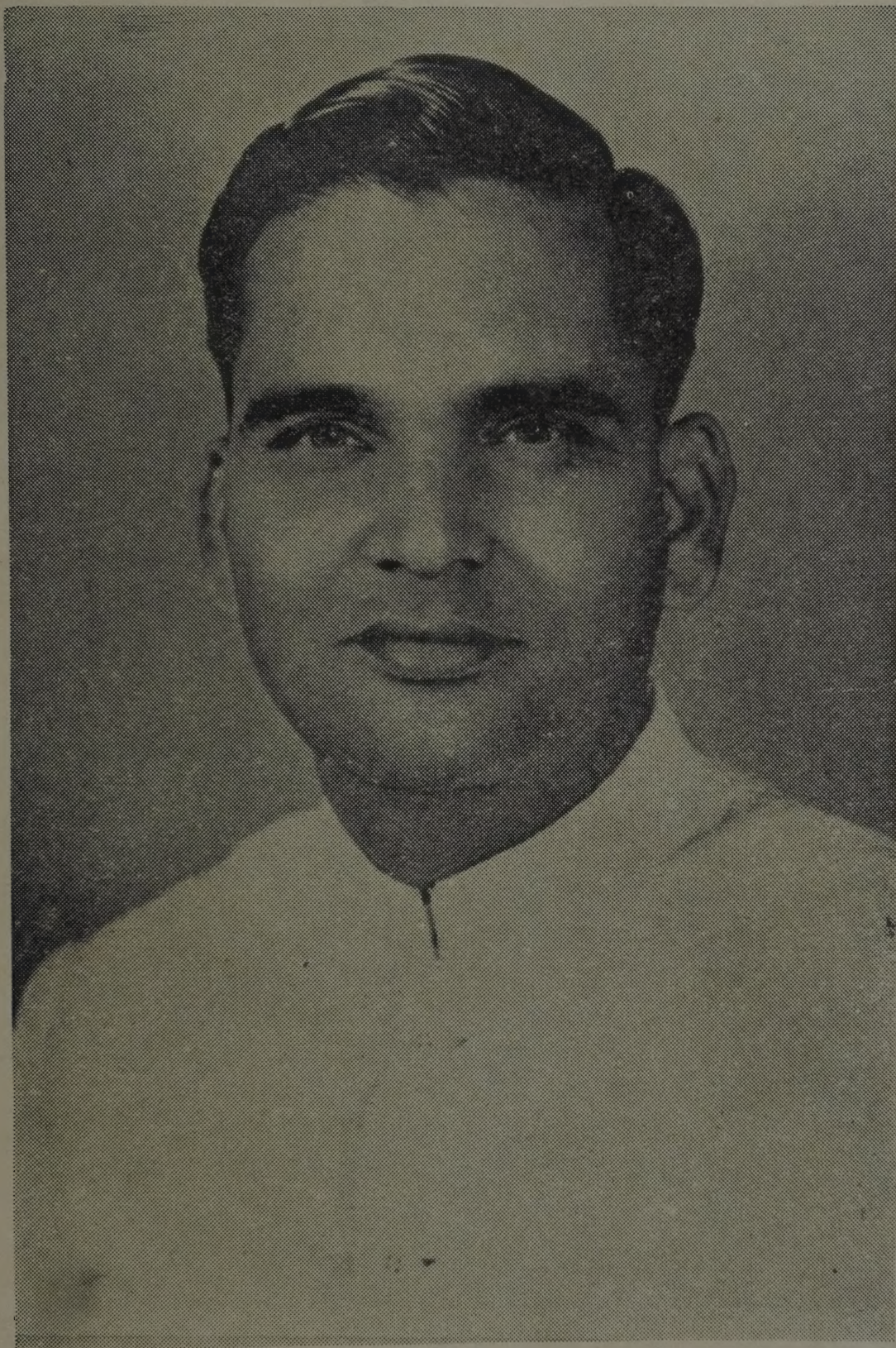
I, K. P. S. Menon, hereby declare that the particulars given above are true to the best of my knowledge and belief.

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Our Prime Minister Shrimati Indira Gandhi



SHRI MANUBHAI SHAH
Minister for Commerce

The Seafood Industry is indebted to Shri Manubhai Shah, Hon'ble Minister for Commerce, for introducing the Export Promotion Scheme which was responsible for the creditable Export performance achieved by the Industry.



MINISTER FOR FOOD,
GOVERNMENT OF INDIA.

Krishi Bhavan,
New Delhi.

April 12, 1966.

MESSAGE

I am glad to learn that the Indian Seafood Exporters' Association is bringing out a journal entitled "Seafood Exporter" as the official organ of the Association. I am aware that the fisheries potential in the Indian seas is enormous but hardly one-tenth of the potential is being exploited at present. The seafood processing techniques which were initiated and developed by the Central and State Governments have been well taken up by the industry. The export of fisheries products has been steadily increasing for the past one decade and has crossed the Rs. 7 crores mark, and it is expected that with greater efforts on the part of the Government as well as the industry, the quantum and value of export would further rise, making a sizable contribution to the earning of foreign exchange. It is essential that the Indian seafoods exported should be of high quality. I firmly believe that the fishermen, the processors, the Departments of Fisheries and the traders would cooperate in the development of the Indian fishery industry, and help to raise production for developing exports, and establish a name for Indian seafoods in the world market. I wish the journal success for useful contribution to the industry.

(Sd/-)

P. Govinda Menon

Seafood Exporter

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Editor.

SEAFOOD EXPORTER

VOL. 1

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MAY, 1966

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ISEA —

INDIAN SEAFOOD EXPORTERS ASSOCIATION, COCHIN

The Association formed a year ago is the leading Association in the field with a majority of exporters from all over India as members. There are at present 77 members - 39 from the Fresh, Frozen and Canned Seafood Exporters and 38 from the Dried Seafood Exporters.

Out of the 14 elected members of the Marine Products Export Promotion Council (sponsored by the Government of India) 12 are our members and out of the 5 elected members of the Committee of Administration of that body 4 are our members.

The Association is dedicated to serve the Fishery Industry and the Seafood Exporters.

On the occasion of bringing out the first issue of our Journal "SEAFOOD EXPORTER" we pledge to continue to serve the industry for its growth and prosperity.

INTRODUCTION

IT is with great pleasure that I present you the "Seafood Exporter", the official organ of the Indian Seafood Exporters Association.

The Indian Seafood Industry has been making rapid progress in recent years. Publication of a magazine of this type is yet another achievement of the industry and I am sure this will go a long way in the development of the industry.

Need for a forum to discuss the common problems of the industry was felt by the Indian Seafood Exporters Association for some time. It is a matter for gratification that the aspiration of the Association has been fulfilled with the publication of this magazine.

The Magazine, besides discussing the common problems will also serve as a medium to establish contacts between our members and the businessmen abroad who are engaged or interested in the Seafood industry. Due coverage will be provided to all subjects of interest to the Seafood industry and the magazine will also carry articles of interest contributed by competent persons from India and abroad.

Members of our Association are fully aware of the important role played by their Foreign agents and buyers in promoting the industry and securing a pride of place in the world market for the Indian Shrimp. On this occasion we offer our warm gratitude to those friends abroad who have rendered valuable services in promoting this Indian industry.

Indian seafood exporters have earned high reputation in world markets and today excellent relationship exists between Indian Exporters and their foreign buyers. I earnestly hope that this Magazine will further strengthen the very cordial relationship and open more opportunities to expand the trade.

It is also my hope that this organ will prove to be a useful medium to promote friendship and goodwill among members of the industry in the country and thus pave the way for a bright future for the Seafood Industry.

Cochin,
20-5-1966

Kurwath Damodaran,
President,
Indian Seafood Exporters Association.

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Editorial

THE Seafood Industry although an infant industry has made good progress during the last 4 years. Our exports from 4 Crores have reached 8 Crores within this period. This is a remarkable achievement. The Export Promotion Council and the Commerce Ministry have played a very important role for the development of the industry, especially by encouraging the exporters giving various concessions including incentive licences.

Although the Industry has now developed to a certain extent, it is today facing a crisis due to the Government entering into the export field in competition with the private sector. The Government of India have registered a Corporation with foreign collaboration and allowing undue concessions to the collaborators. The Kerala Government also have registered a Corporation. The Indo-Norwegian Project are also going to enter the export field. There is, therefore, certain amount of anxiety among the exporters as to what will be their future and whether these Corporations will monopolise the seafood export trade.

The industry is fully conscious of the role it is called upon to perform for the progress of the country. With necessary assistance from the Government it could have raised the exports to 20 Crores annually during the Fourth Plan period. Now, with the Corporations around it and with its future unknown it is doubtful whether the industry will be able to fulfil its obligations. These developments are the direct result of the Government policy which failed to clarify the future of the private trade engaged in this industry. We, therefore, appeal to the Government to announce the policy to be adopted for the next 10 or 15 years in respect of the private sector functioning in the seafood industry. This, in our opinion, will put the doubts and anxiety prevailing in the industry to rest and then the industry will be able to direct its efforts towards national progress.

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THE KERALA FISHERY CORPORATION —

*It is a menace to fishermen and
the fishery industry*

T. HARIHARAN

Member, Central Fishery Advisory Board

IT is to be regretted that the Fishery development in Kerala is sharply deviating from the basic guidelines prescribed by the Planning Commission and the Central and State Governments. The Fishery Corporation organised here without consulting either the State Fishery Advisory Board or the representatives of fishermen is an instance for it. This Corporation will have far reaching ruinous effect on the fishery industry as well as the fishermen.

In this State, a large section of people who number about two million depend on fishing for their daily bread. They are the most backward in the State. Exploitation by the middlemen, relentlessly reign supreme in this sector. When the monsoon is on, utter starvation is the lot of this coastal population. As a remedy for this, fifteen years ago the Planning Commission suggested in their draft report on the First Five Year Plan that Co-operative movement should be developed in the fishery sector. In pursuance of this, Kerala Government called upon fishermen to organise Co-operative Societies. They gave the assurance that modern equipments and implements for fishing will be given to fishermen on a subsidised basis of hire-purchase. They said that the Processing Plants will be handed over to the Marketing Societies of fishermen. Trusting these pledges, fishermen enthusiastically responded to this call and organised 210

production societies in the place of the Third Plan target of 180 societies. They organised four marketing societies also. The Fishery Co-operative movement in Kerala was lauded throughout India as a model to other States. The Government proclaims that production, processing and marketing of fish will be exclusively entrusted to these societies. This move to redeem fishermen from poverty and give them a reasonable human standard of life was one in the right direction.

At the early days of the first Five Year Plan, the income from the export of marine products was only to the tune of a couple of thousands of rupees. Now it has exceeded Rs. 8 Crores. By the Fourth Plan, the target is to raise it to Rs. 20 Crores. Though production of fish and its earnings have increased to this incredible extent, the fishermen throughout the coast who are the primary producers of this wealth are still subjected to intermitient spells of starvation. This backward lot of these people can be solved only by diverting the prosperity in the fishery sector to the coastal areas by carefully bringing production, processing and marketing of fish under co-operatives. What that is called for now is an intensive effort to consummate this Co-operative set up. Instead, the Government totally reversing their stand say that it is the Fishery Corporation that is good for fishermen!!

Shri. K. K. Ramankutty, Commissioner for Agricultural Production, stated that the Corporation will engage itself in the production, processing and marketing of fish. If that is so, what is the work left for Co-operatives in the Fishery Sector? How can they continue to exist? Will they not gradually wither away into a stage of liquidation?

Co-operative movement is the only recourse left for backward sections to work out a socialist economy free from starvation. It is the reason why co-operative movement has been prescribed in the sector of Coir, handloom, etc. Co-operation instead Corporation has been opted even in the agricultural sector as it alone can give a better standard of life to the primary producers.

All the transactions that are said to be taken up by the Fishery Corporation can as well be handled with the assistance of the department of fisheries by the Co-operatives in the fishery sector. If the Government are prepared to lend financial assistance to the existing societies in the requisite measure, we are prepared to prove that we can undertake these transactions better. Of-course it will be under the strict control of and guidance from the Government. It is said that Fishery Corporation can pay better price to fishermen. It is a statement quite contrary to facts. Even now, departmental officers are purchasing prawn from fishermen in the Malabar area. The rate paid is below the current market price. In order to manage the Corporation, a set of officers has to be appointed on fat salaries. That expenditure itself will become too much for the Corporation. When the Corporation begins to

function in full blast, it is but natural that strike and lock-out will bedevil its working in all its departments. On the contrary, if these activities are organised under Co-operatives the industry will flourish and the fishermen will be saved. Thus it can be easily deciphered that co-operation is the only means left for the smooth development of fishery industry.

There are a few tycoons in the fishery sector. Is it that the Corporation was moulded in the crafty brains of the officers in order to assist these tycoons who are their friends? When this Corporation begins to function, the co-operative movement in this sector will completely fade out. The Corporation too will ultimately go to liquidation due to strike, excessive expenditure on salaries and other foreseeable reasons. As a result the entire industry will come under the tutelage of these few tycoons. The department of fisheries in Kerala should know that the fishermen have that much intelligence to see through this game.

Shri. Ramankutty is a respected officer who has real sympathy for the unfortunate backward sections. It is too much on the part of the department of fisheries to have made him speak in the strain that the Corporation is beneficial to fishermen when actually it is a deadly poison to all their hopes for a better deal. The Fishery Corporation is really harmful to the fishermen of Kerala. It is the Co-operative movement alone that should be developed in this sector. For it, fishermen will fight the Corporation and all its activities with all the strength at their command. I avail of this occasion to make it quite clear to the Government.

—/—

Future of Dry Prawns Trade

V. K. Sreedharan

Proprietor,

*Aquatic Food & Allied Products,
Cochin.*

THE Dry Prawns trade is of late facing a very difficult and serious situation. The traditional market for Dry Prawns had been Burma to which country about 90% of the entire products were exported. Since nationalisation of imports in Burma, orders for Dry Prawns have not been regular. Last order placed by that country was in May 1965 and since then no order have been received. Enquiries made by our exporters have not been helpful to ascertain the intentions of the Burma Buyers. As there is no other substantial market for Dry Prawns the trade is passing through a period of crisis and it is feared that thousands of fishermen and those traders engaged in the Dry Prawn Trade will be put to untold misery.

Attention of the Government was drawn to this state of affairs but it seems that no effective steps were taken by the Government. The Marine Products Export Promotion Council have also not been able to do much in this respect. Evidently, there is eagerness at all quarters to encourage exports of Frozen and Canned products whereas the Dry prawns trade is receiving only a step-motherly treatment.

It is true that of late, a considerable portion of Prawns are being diverted for quick freezing and canning. A large quantity still remains to be processed into dry prawns. Lack of facilities for easy and quick transport to freezing

Centres and lack of adequate capacity for quick freezing and canning shall necessitate a considerable portion of the catches to be processed into Dry Prawns. Besides, certain varieties of Prawns which are not suitable for Freezing or Canning are also processed into Dry Prawns. It, therefore, becomes necessary to find out markets for the Dry Prawns thus produced. While making all efforts for resumption of trade with Burma earnest efforts should also be made to find out alternate markets. Countries like Malayasia, Singapore, Japan, Australia and Marutius are prospective buyers. Hongkong is another major buyer. U. S. A, U. K. and Canada are also interested in Dry Prawns. These countries are buying only small quantities at present. With some efforts at Government level these countries can be made to buy large quantities.

In the case of Burma, resumption of exports will be possible if the Dry Prawns exports are linked with import of much needed Rice from that country. If this suggestion is found unacceptable then the Government should come forward to offer concessional terms to Burma in respect of payment etc., to persuade them to make immediate purchase.

It is hoped that the Government will loose no time in coming to the aid of this traditional trade which otherwise will be vanished.

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ISEA Appeals to Prime Minister to Stay Kerala Fisheries Corporation from Entering Export Trade

The Indian Seafood Exporters Association in a memorandum submitted to the Prime Minister Smt. Indira Gandhi appeals to stay the Kerala Fisheries Corporation's entry into export trade till an elected Government takes over in the State.

MEMORANDUM

We the members of The Indian Seafood Exporters Association, respectfully submit the following before the Government of India for kind consideration and necessary action:—

1) Formation of the Kerala Government Fisheries Corporation have been announced by the Government of Kerala and we understand that the Corporation will start functioning very shortly. Hitherto the Government of Kerala Fisheries Department were functioning for the development of Fisheries and service to the Industry. The avowed policy of the Kerala Government were to encourage Fishermen, Fishermen Co-operatives and to encourage exports and exporters.

2) The proposed Corporation we understand, will be taking over all the major assets of the Kerala Government Fisheries Department including all the Freezing Plants, Ice Plants, Boat Building Yards etc., which have been valued at 1-6 Crores which will practically

liquidate the Fisheries Department of the Kerala Government. The idea behind this Corporation, as originally proposed was, to expedite the work of the Department of Fisheries for construction of freezing and cold storage Plants, Ice Plants, Boat Building etc., and to save the Department from Red-Tapism, if any. But it is now made known that the Corporation is entering into the Seafood Export Trade in competition with the private exporters.

3) As a prelude to the Corporation the Government of Kerala have taken over from 1-1-66 the Calicut Plant of the Government where 4 private exporters were freezing and exporting Shrimp. The other Plants, viz., the Cochin Plant and the Neendakara Plant also have been taken over by the Government recently. This virtually ousts 16 private exporters from the field who have longstanding commitments with foreign countries and lot of money already blocked on packing materials and other investment for the exploitation of

the Government Freezing Plants. Among the 16 exporters who are affected by this are three Co-operative Societies, viz., The Kozhikode Mechanised Fishermen Co-operative Society Ltd., The Travancore-Cochin Prawn Curer's Co-operative Marketing Society Ltd., Cochin, which is one of the leading and the oldest Fishermen Co-operative Societies in the field in India and the Quilon Regional Fishermen Co-operative Sales Organisation Ltd., Neendakara, Quilon.

4) The repercussions of a Government Corporation entering into direct competition with the private sector in regard to purely commercial operations like freezing, exporting etc., and secondly how far a Government Corporation would be able to successfully compete in a business involving the purchase and handling of a highly perishable commodity like Shrimp (Prawns) at sharply fluctuating market prices and bristling with many risks in the matter of purchase, processing and marketing are matters worth serious consideration. We can appreciate the Government starting a Corporation for basic fishery industries, viz., Marine Diesel Engine Manufacture, Net Making, Can Making, Boat Building, Manufacturing of Canning, Freezing, Fish Meal and Cold Storage machinery etc. The fishing industry is hard hit due to the shortage of basic amenities such as Electricity, Water and Ice. The Industry is short of Fishing Trawlers which have to be imported from foreign countries. Fishing Harbours and landing facilities at potential grounds which offer immense scope for better exploitation are the further urgent requirements of the industry. These problems of the industry were brought to the notice of the Government on several occasions and the industry was expecting Governmental Assistance to solve these problems. If the Corporation enters into these developmental lines it will be a great help to the Fishing Industry to increase the exports. The industry will gladly welcome a Corporation formed for such purposes. But

the Corporation's intentions to enter into export trade in competition with the private trade has come as a great surprise to the people engaged in the industry. It is felt that it is not a wise policy for the Corporation to enter into export trade in competition with the private sector.

5) We understand that the State Government is not utilising even 25% of the capacity of the Calicut Plant. According to the Director of Fisheries the Government have exported only 1.05 lakhs worth Frozen Shrimp during the 3 months period after taking over the Calicut Plant. If the 4 private exporters were allowed to continue they would have exported 5 times more than this. It was during the peak-catching season that the said Plant was taken over but still the exports made by the Department was much less. This performance of the Department shows that they will not be able to maintain the exports.

6) Presently there are about 400 boats issued by the Fisheries Department of Kerala to the Fishermen on subsidised prices and these boats were the source of raw products for the exporters who have long standing contracts with these boat-owners. With the Corporation starting its own exports these boats will operate for the Corporation and the private trade will be deprived of this source of supply and therefore they will not be able to run their factories to the full capacity. At the same time the Government will also not be able to utilise the huge quantity of catches because of the perishable nature of the commodity. All these could have an adverse effect on the steady flow of exports and earning of Foreign Exchange.

7) After the introduction of compulsory pre-shipment inspection nearly a year ago, the quality of Indian Shrimp whether frozen or canned is equal to the best in the world and there have been no detention of Indian Shrimp on the score of quality in any of the importing countries. In view of this it has to be clearly

understood that a Government Corporation cannot achieve any improvement so far as the quality is concerned. By entering into the export trade the Corporation will not be able to give any better performance than the private exporters have been doing hitherto. Instead, the Corporation will do much harm to the exports of the country by dislocating the private trade. - It is, therefore, a matter for earnest consideration whether such a move would be in the longterm interests of the industry and all exports generally.

8) Ordinary a Government Corporation does not undertake a commercial industry particularly in perishable commodities when sufficient private initiative is forthcoming. It is only where such initiative is not forthcoming either due to want of sufficient capital or due to the unremunerative nature of the enterprise the Government takes the initiative. In the case of the Shrimp Industry the private sector has over the last 8 years taken all the initiative and all the risks in developing this industry and they have undoubtedly made a success of it.

9) In the interests of continued development of an important industry which is one of our most valuable foreign exchange earners, the Government will no doubt examine the basic policy to be adopted in the functioning of the proposed Corporation particularly in so far as it relates to the Government entering into direct competition in the production and export of Frozen and conned Shrimp. By entering into the export trade in competition with the private exporters, the Corporation violates the Declared Policy of the Government of India, viz., the public sector will not compete with the private sector.

10) We may further bring to your kind notice that the Government of Kerala in form-

ing the Corporation, have not taken into consideration the views of the Trade which have built up the industry to its present stage when it earns more than Eight Crores of Rupees by way of Foreign Exchange. The Marine Products Export Promotion Council's views also were ignored by the Kerala Government. The only view which was taken into consideration is that of the Head of the Fisheries Department who is due to retire but has been nominated as Managing Director of the Corporation and who is very particular to start the Corporation before an elected Government is formed in this State.

11) Fate of West Coast Fisheries Ltd. It can be reasonably apprehended that the Fisheries Corporation will have in all probability the same fate of the erstwhile West Coast Fisheries Limited of the Kerala Government. The West Coast Fisheries Ltd., was the first concern in the field for fishing, processing and export of Shrimp from India. It was a concern with major shares by the Kerala Government. Since the Kerala Government could not successfully run this concern, the same was liquidated some time ago by the present Director of Fisheries who is now nominated as the Managing Director of the Corporation. It is a matter for serious thought whether the same Department of Fisheries who could not run a small Company can successfully manage or run a much bigger Corporation. In this connection it may kindly be noted that all the Industrial undertakings run by the Kerala Government have been working on loss according to the report of the Parliamentary Committee headed by Shri Panampally Govinda Menon, which inquired the functioning of those concerns.

12) We may further submit that even before the Corporation started functioning, the Fisheries Department have entered into an

agreement for selling all their products exclusively to an American firm and this have been done by the Department without calling a global tender. This step taken by the Government also violates the approved policy followed by the public sector undertakings.

It is therefore prayed that the Honourable Prime Minister may be pleased to give fair and due consideration to the facts submitted above and issue necessary orders staying the Kerala Government Fisheries Corporation from entering in the Export Trade till such time as a popular elected Government is formed and examines all aspects of the proposal.

On behalf of the Indian Seafood Exporters Association, Cochin.

President:

Kurwath Damodaran,
P. B. No. 79,
Ernakulam.

Member:

P. V. Aviratharakan,
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OUR DRIED FISH TRADE WITH CEYLON

S. AMBROSE FERNANDO

*President, Fish Exporters' Chamber, Tuticorin &
Managing Partner, The Seafood Export Corporation, Tuticorin.*

CEYLON is the largest importer of Indian dried fish and our association with her in this trade dates back to ancient times. The quantum of this commodity imported by countries other than Ceylon is so small that we could safely brand Ceylon as our only market for our dried fish.

Our exports which stood at 25,932 tons valued at Rs. 4.43 crores in the year 1959, steadily and steeply declined in the subsequent years and in the year 1962 it came down to the rock-bottom level of 4,703 tons valued at Rs. 54.14 lakhs only. This serious decline in the exports in that year has been mainly attributed to the after effects of the dramatic changes enforced by the Government of Ceylon in the mode of dried fish import trade.

Upto 1961 the import in dried fish in Ceylon was in the hands of the private sector mostly merchants from India. As a policy the Ceylon Government instituted the Co-operative Wholesale Establishment (commonly known as the CWE), an organisation created by an act of Parliament to cater to the needs of the people as a monopolistic importer in Ceylon for dried fish.

The change had driven almost all the then importers of dried fish in Ceylon and their principals in India into wilderness. As a consequence the exports were paralysed. In order to restore the exports to the original level, the exporters formed themselves into an association at Tuticorin called the Fish Exporters' Chamber, to mobilise their resources and energy in the trade and to secure the maximum benefits to the fishermen and the country at large.

Tuticorin is the primary traditional outlet for dried fish of Indian origin and Ceylon being our closest neighbour the goods shipped at Tuticorin reach Ceylon within 18 to 24 hours in as fresh a condition as possible.

The government of India & Ceylon reviewed the situation caused by the declining trend of this trade after coming into being of the CWE and entered into a Trade Agreement to stabilise the trade. The Government of India introduced various export promotion schemes to boost the exports. The encouragement given by the Government and the Marine Products Export Promotion Council coupled with the untiring endeavours of the exporters reversed the trade and the exports in 1963 were almost double

than that of the previous year (8,560 tons valued at Rs. 1.31 crores). In the year 1964 the quantity exported rose up still further to 10,240 tons valued at 1.6 crores of rupees. This steady increase raised the hope of achieving the target of 21,000 tons in 1965. But to the entire dismay of all concerned, the exports in 1965 dwindled down alarmingly almost to the level of 1962, the quantity exported being 4,567 tons valued at Rs. 67 lakhs only.

Failure of seasonal catches on one side and development measures like the provision of roads, ice and cold storage facilities on the coasts by the State Department of Fisheries on the other side created scarcity conditions in the production of exportable varieties of fish. During the pre-cold storage days, the volume of fish bought for local sales were to the size of the day's requirements only and the balance went to the curing yards for the preparation of dried fish; whereas now-a-days a chain of regulated internal markets for fresh fish has come to stay resulting in the down fall of the exports. This ready market at attractive prices and the increase in off take of fish by our growing population also act as a disincentive for our traditional export of dried fish to Ceylon.

Pakistan is our major competitor in our dried fish trade with Ceylon. Since she provides many amenities to her exporters to carry on their dried fish export trade profitably, Pakistani exporters are placed in a better position than their counter parts in India. As a result of having a single market the trade has many peculiar features which we may not find in

other trades. The prices are fixed by the buyers themselves. The expansion of internal trade and the scanty availability of the exportable varieties of fish are the major handicaps for the exporters to keep the local prices within the limit of the ceiling placed by the importers.

To enhance the export performances the production must be adequately increased. It is vital that the cost of production should be as low as possible. This could be done only by an all-out national exploitation of the fishery wealth in the deep seas by means of trawlers. The exporters may be encouraged by means of loans and subsidies and technical know-how to increase in the production of fish for export. As dependant of Ceylon for the disposal of our dried fish, our country is in a disadvantageous position in the sphere of securing better prices for our produce. Alternative markets are essential and to achieve this end adequate propaganda may be carried on in other countries to popularise the use of our dried fish and fish products. As part of such a propaganda, delegations may be organised to visit various countries to explore the ways and means to introduce our produce in those countries with reference to the price structures and consumer preferences.

In conclusion I would state that all possible effective measures may be taken to enhance the production of fish most economically and the shippers may be encouraged with amenities and facilities to enable them to market their products in the world markets so that this export trade can contribute in a large measure as steady and rising source for earning foreign exchange.

NEWS & NOTES

Election to the Marine Products Export Promotion Council.

The following Members of the Indian Seafood Exporters Association have filed nomination papers to contest the Election for the seats falling vacant in June, this year.

Fresh, Frozen & Canned Panel.

1. *Cochin Seat:* Shri Baby John, Kerala Seafoods, Neendakara, Quilon.
Vice-president of the Association,
2. *Calicut Seat:* Shri P. I. Gopalan Nair, Feroke Frozen Foods, Feroke, Calicut.
Alternate candidate:
Shri T. M. John,
Thycoodan Commercial House,
Cochin.

Dried Panel.

1. *Tuticorin Seat:* Shri Ambrose Fernando, President, Fish Exporters Chamber, Tuticorin.
2. *Bombay Seat:* The Gujarat Fisheries Central Co-operative Association Ltd., Veraval, Gujarat.

Shri P. K. Dewer Visits far Eastern Countries.

Shri P. K. Dewer, Director of Travancore-Cochin Prawn Curers' Co-operative Marketing Society (a member of the ISEA), who went on a business tour of the Far Eastern countries returned recently. During his visit Shri Dewer

had discussions with several leading importers of Malayasia and Hong Kong on the possibility of increasing Dried shrimp exports to those countries.

Kerala Fishermen Congress Opposes Kerala Fisheries Corporation.

The Kerala Fishermen's Congress, a wing of the Congress Party have strongly protested the action taken by the Government of Kerala to form the Kerala Fisheries Corporation. The Corporation, according to them is detrimental to the fishermen. The Congress, have appealed to the Central and State Governments to withdraw the Corporation, failing which they have decided to launch a state wide agitation against the Corporation.

Bringing the Prawn Peeling Sheds Under the Factory Act Provisions.

The Indian Seafood Exporters Association have protested to the Government of Kerala on the steps taken by them to bring the prawn peeling sheds situated all over Kerala under the Factory Act Provisions. The Association have also appealed to the Government to withdraw the prosecutions already launched against certain peeling shed owners.

Shri H. G. Nazareth in U. S. A.

Shri H. G. Nazareth, Managing Director of M/s. Mettallica Works (P) Ltd., Bombay,

(a member of the ISEA) is on a visit to U.S.A. to study the market situation for Indian Seafood in that Country. He is also negotiating with leading American Suppliers for supplying Machinery for a large Freezing Plant which his firm intends to put up in India.

Seafood Exporters Harrassed by S. P. C. A. Officials.

One of the ISEA members Shri A. Johnson from Bombay has complained of harrasement by the S.P.C.A. (Society for Prevention of Cruelty to Animals) Bombay who have been seizing the packages of Frogs consigned to him by his suppliers, on the ground that the bags contained more than 30 frogs and has appealed to the Chairman, Marine Products Export Promotion Council and also the President of the ISEA to intervene in the matter and save the exporters from interference on flimsy grounds.

Increased Capacity for Seafood Industry.

The Seafood Industry is expected to substantially add to its capacity when construction of the new plants taken up by a number of exporters are completed. Shown below are some of the plants, construction of which are progressing.

Freezing Plants.

M/s. Kerala Seafoods, Neendakara, Quilon.

M/s. Austin & Philo Seafood Exporters, Quilon.

M/s. Thycoodan Commercial House, Cochin.

M/s. Cochin Fish Canning Co., Ernakulam.

M/s. Myco Fisheries, Cochin.

M/s. K. E. Kesavan & Co., Cochin.

M/s. Hazarat & Co., Cochin,

The Travancore - Cochin Prawn Curers' Co-operative Marketing Society Ltd., Cochin-2.

Canning Plants.

The Travancore-Cochin Prawn Curers' Co-operative Marketing Society Ltd., Cochin-2.

M/s. Aquatic Food & Allied Products, Cochin.

M/s. Solar Fisheries, Cochin-6.

M/s. Feroke Frozen Foods, Feroke, Calicut.

Birla Bros.

Entering Seafood Industry.

The Birla group firm M/s. Bharat Trading (International) Ltd., (a member of the ISEA) who have been handling seafood trade for some time are shortly installing a large-scale Seafood Freezing Plant. They are also importing trawlers for fishing operations.

Seafood Cannners' and Freezers' Association Singing to the tune of Kerala Fisheries Corporation.

The Seafood Cannners' and Freezers' Association who pretended to oppose the Kerala Fisheries Corporation have now joined hands with the Corporation as a result of nomination of two Directors from among their members. Our apprehension that this Corporation is formed for favouring monopolists have been thus justified.

Atsonco Enters Canning

M/s. Atsonco, Ezhupunna are starting a Canning unit for which they have imported the Machinery from Denmark.

U. S. A. Shrimp Market Declines

According to reliable information available from U.S.A. the prices for certain varieties have declined. The larger size Peeled and Deveined Shrimp running from 31/35 through 61/70 have declined approximately 5 cents a lb. The smaller size Peeled and Deveined Shrimp running from 71/90 through 135/up have declined one to two cents per lb.

The decline coming for the first time in some months have been taken as significant by the American importers. They are also of the opinion that there will be further decline for the small sized peeled and deveined shrimp. But they expect an increase in price for the large size shell on Headless Shrimp such as U/15 and 16/20 during the coming months.

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Thoppumpady,
Cochin-5. | 8. M/s. Coastal Food Packers,
P. B. No. 40,
Palluruthy, Cochin-6. |
| 2. M/s. Atsonco,
Ezhupunna,
Alleppey Dist. | 9. M/s. Coronet Canning Co.,
Raj Mandir,
Malpe, S. Kanara,
Mysore State. |
| 3. M/s. A. Avaran & Sons,
Central Market,
Calicut. | 10. M/s. M. J. Durazi & Bror.,
29, Mandvi Chambers,
Bombay-9. |
| 4. M/s. Bharat Trading (International) Ltd ,
Nilhat House,
W/Island, Cochin-3. | 11. M/s. Feroke Frozen Foods,
Export House,
Kuttakalam,
Kolathar P. O.
Feroke. |
| 5. M/s. Calicut Food Packers,
P. B. No. 6,
New Road, Calicut. | 12. M/s. Goa Food Products (P) Ltd.,
Chowgule House,
Marmagoa Harbour,
Goa. |
| 6. M/s. Canning Industries (Cochin) Ltd.,
P. B. No. 48,
Trichur-1. | 13. The Gujarat Central Fisheries
Co-Operative Association Ltd.,
Bunder Road,
Veraval. Gujerat. |
| 7. M/s. Champion Corporation,
Nanabhai Mansion,
Sir P. Mehta Road,
Bombay-1. | |

14. M/s. Haji Jumma Ahmed & Co.,
Sewri Cross Road,
Bombay-15.
15. M/s. International Canning Co.,
Alwaye.
16. M/s. A. Johnson,
Usha Kiron,
2nd Pasta Lane,
Colaba, Bombay-5.
17. M/s. John & Co.,
Neendakara, Quilon.
18. Dr. C. C. John, (Hony. Member)
Retired Director of Fisheries,
Trivandrum.
19. M/s. Kaivarthaka Industrial Works,
Bunder, Mangalore-1.
20. M/s. Kerala Seafoods,
Neendakara, Quilon.
21. M/s. K. E. Kesavan & Co.,
Cochin-2.
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Cochin Fish Canning Co.,
Ernakulam.
23. The Maharashtra Raja Machimar
Sahakari Sangh Ltd.,
3, Mahatma Phule Fish Market,
Bombay-1.
24. M/s. Metallica Works Private Ltd.,
79/83, Dr. Annie Beasant Road,
P. B. No. 6565,
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25. M/s. Malabar Pack Marines,
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Calicut.
26. M/s. Malabar Fisheries Co.,
Chaliyam P. O.
Via Feroke.
27. M/s. Merino Fisheries,
T. D. Road,
Ernakulam.
28. M/s. Myco Fisheries,
Cochin-5.
29. M/s. Orient Seafoods.
Quilon.
30. M/s. Pure Products and Madhu Canning
Ltd.,
P. O. Bag 7201,
Chembur, Bombay-71.
31. M/s. Peninsular Frozen Foods,
Phiroz Manzil 27/37,
Guzzar Street,
Bombay-5.
32. M/s. Premier Fisheries,
Market Basin, Ernakulam-1.
33. M/s. Pisces Corporation,
Kaloor Road, Ernakulam-8.
34. The Quilon Regional Fishermen
Co-Operative Sales Organisation Ltd.,
Neendakara, Quilon.
35. M/s. R. N. Rustomji,
Shreenivas House,
Outram Road,
P. B. No. 885, Bombay-1.
36. M/s. Solar Fisheries,
P. B. No. 6,
Palluruthy, Cochin-6.
37. M/s. Thycoodan Commercial House,
Cochin-2.
38. The Travancore Cochin Prawn Curers' Co-
Operative Marketing Society Ltd.,
Cochin-2.
39. M/s. XL Seafoods,
Pachalam, Ernakulam-2.

Dried Marine Products Exporters

1. M/s. Abdulhamid Ahmed & Co.,
Sewri Cross Road,
Bombay-15.
2. M/s. M. M. Abdulkader,
P. B. No. 73,
Mangalore.
3. M/s. B. K. Abdulkhader & Co.,
Tuticorin-1.
4. M/s. Aquatic Food & Allied Products,
Jew Town,
Cochin-2.
5. M/s. Anandilal More,
Cochin-2.
6. M/s. M. D. Bhoola & Co.,
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Tuticorin-1.
19. M/s. A. Joseph,
Tuticorin-1.
20. M/s. Kerala Aquatic Products Co.,
Tuticorin-1.
21. M/s. T. P. Koya,
Tuticorin-1.
22. M/s. P. A. Moideen Kunju,
Tuticorin-1.
23. M/s. Mermaid Fisheries,
Jew Town,
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24. M/s. Malabar Ocean Products Co.,
Jew Town,
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5. M/s. Memon Bros, & Co.,
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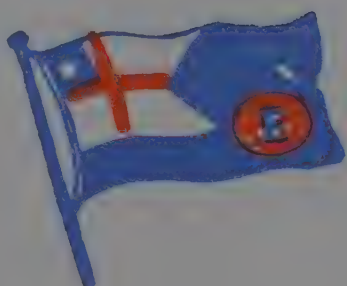
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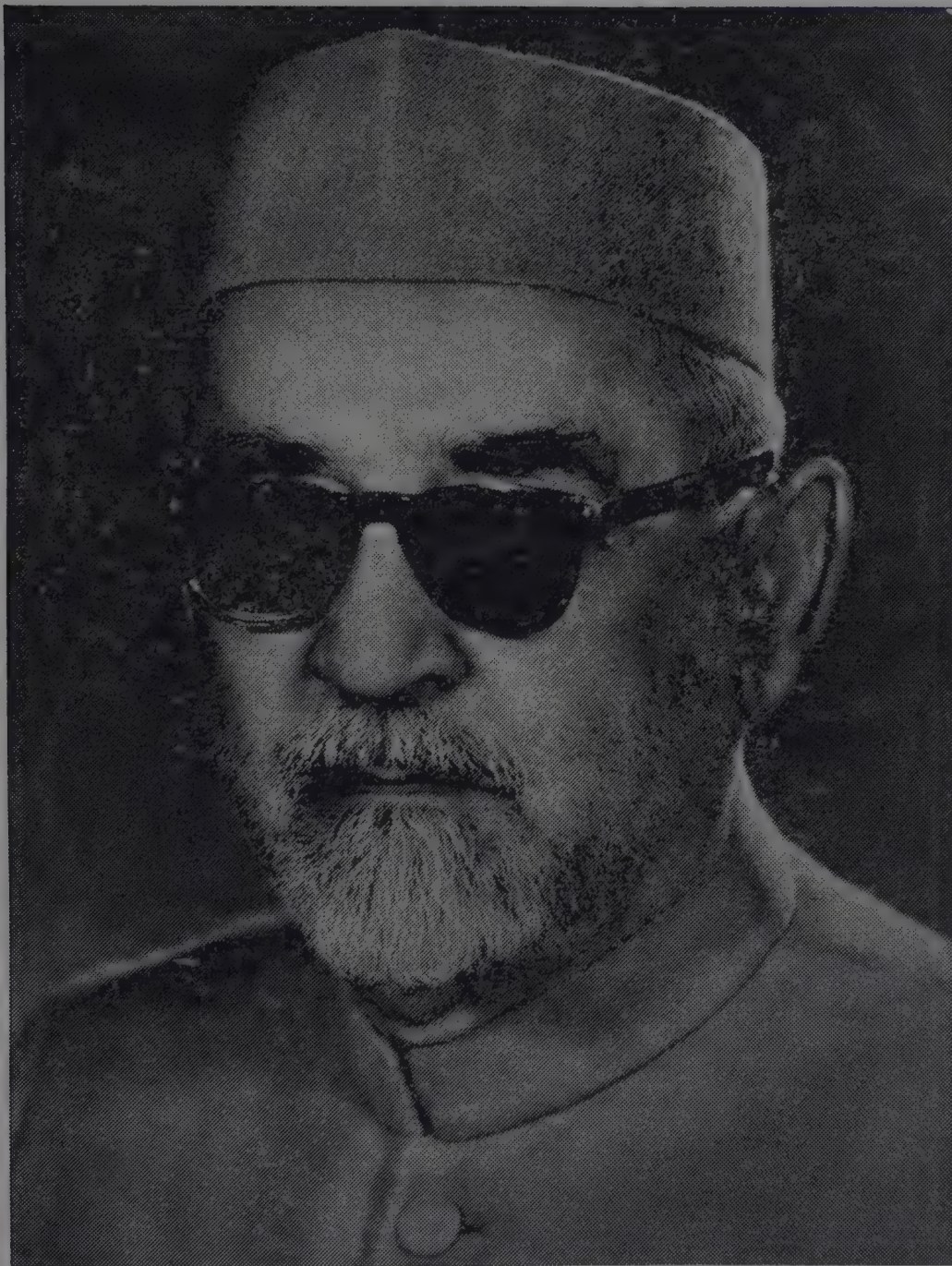
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DR. A. N. BOSE
Director, Central Institute of Fisheries
Technology & Chief of Seafood
Quality Control inspection

Dear Shri Damodaran,

I thank you for sending me a copy of the first issue of the Journal 'Seafood Exporter' brought out by your Association. I am very much impressed by the get-up and presentation of the Journal. I have also read the articles in the Journal with deep interest.

With best regards,

Yours sincerely,
Sd/-
(A. N. Bose)

Shri Kurwath Damodaran,
President,
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THE Seafood Industry faces a difficult situation following devaluation of the rupee. It is undeniable that much of the progress recorded by the industry in such a short time is attributable to the important role played by incentives enjoyed by it. While the private sector in this industry was enthusiastically preparing itself to increase the exports conspicuously during the Fourth Plan Period, the Government's decision to abolish the incentives has come as a shock.

Admitting that the increased exchange rate would give a higher earning in terms of rupees, there is no certainty that the foreign prices would remain at the pre-devaluation level. Taking advantage of the devalued rupee, foreign buyers are already trying to reduce the prices. Apart from this, the internal prices for raw materials have shot up. The steamer freight has also increased proportionately. There are indications that packing materials and tin cans would also become dearer. After accounting for these increases the Seafood Exporters will not be left with any margin to cover up the loss of incentives. Besides, there are the rupee payment transactions for which no specific relief is provided. There is, therefore, some panic in the Seafood Industry.

This industry which is still in its infancy has its own peculiar problems as distinct from other industries and exports. Heavy risks are involved because of the highly perishable nature of the commodity it handles. Moreover, it depends on several factors such as weather conditions for its raw material supplies. Even in respect of processing, transporting and shipping, these products have to be handled in a different manner. Consequently, this industry is on a footing different from others.

We feel the Government should have taken these factors into consideration before deciding to abolish the incentives enjoyed by this industry hitherto. Now that the decision has been taken, it is necessary in the interests of the country's exports that this industry is brought under a special scheme for assistance in some form other than the import entitlements. We trust that the Government will give due consideration to this suggestion and come forward with assistance schemes so as to enable the Seafood Industry to raise its exports to the targetted level during the current plan period.

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FREEZE DRYING AND A. F. D.

For the past thirty years, pharmaceutical and biological material for medical purposes (for example, blood plasma) has been preserved by a process of 'freeze drying', and many attempts have been made (particularly in the United States) to dry foodstuff in the same way. As usually carried out, the process is slow and expensive, and so is mainly of use for the drying of small amounts of high-priced commodities.

Recent British experimental work has led to a variant of the 'classical' freeze-drying method which makes it possible to handle much larger quantities of material in much shorter times than the older equipment. It is this new system of drying foodstuff that has become known as Accelerated Freeze Drying—now usually called A. F. D.

WHY DRY FOOD?

The foods we eat are attractive not only to us but also to many other creatures—from the cat who steals fish, down to the moulds, yeasts, and bacteria, which grow and multiply upon all food and cause it to become unattractive or distasteful, or even poisonous to human beings. Moulds and other micro-organisms cannot grow in a dry condition, so that if a foodstuff can be thoroughly dried it will not be affected by these spoilage agents. Unfortunately, all the older methods of drying foods resulted in some degree of change, so that the dried product differed (sometimes quite widely) from the original; for instance, compare dried fish with fresh fish.

The earliest methods of drying used the heat of the sun, helped by the wind; later, men began to use artificial heat and forced draught to shorten the process. But, until the introduction of freeze-drying, none of the methods used gave a product which when prepared for the table was as good as the equivalent fresh food; flavours were lost or changed for the

worse, texture became tougher, colours were dulled or bleached. Nonetheless, these dried foods are still a valuable part of the diet of many countries, and drying helps to spread the available foods in time and space, for men and animals—as every farmer who feeds hay or grass will realise.

Now, in the sixties, the picture has changed, for freeze-dried food can be indistinguishable from fresh.

HOW A. F. D. WORKS

In any method of freeze-drying, the material to be dried is first frozen; either by direct evaporative cooling of the food itself under a high vacuum or by some form of refrigeration; it is then held in a very high vacuum so that the ice in the tissues is evaporated as rapidly as possible which under these conditions occurs without any melting. The freezing process is thus only a preparatory step,

subsidiary to the drying process. Drying by the A. F. D. process is complete in from six to ten hours according to commodity, which compares with 24 to 48 hours by older methods of freeze-drying; the product retains the shape and structure of the undried material, but is much lighter in weight. This follows from the fact that most foodstuffs contain between seven and nine tenths of their weight of water; it is this water which is removed in the A. F. D. process. (It comes as a shock to many people to realise that there is more water in a pound of cabbage than in the same weight of milk!).

NOT QUICK FREEZING

From enquiries and conversations it is evident that there has been some confusion in many minds between the A. F. D. process and the 'quick-freezing' (Q. F.) process, so popular at the present time as a means of making seasonal foods such as peas, strawberries, etc., available all the year round. Though freezing

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has a part in both Q. F. and A. F. D., the two processes depend on completely different principles for their preservative effect. In Q. F., in fact, care is taken to minimise loss of moisture by evaporation from the food—in some cases the frozen slab of material is even dipped into, or sprayed with, cold water to give it a thin coat of ice, so that if any evaporation occurs it will be from the ice-coating rather than from the food. Thus the full weight of the food (including the 70-90% water it contains) is stored until it is required for eating; but this storage must be at a very low temperature—as much as 40 degrees Fahrenheit below freezing point.

This means that special refrigerated stores, transport vehicles, and sales cabinets must be used—a complete 'cold chain'—to keep the food frozen hard at all times until it is required for the table; once thawing begins, the material

cannot be re-frozen without suffering serious loss of quality, so that, unless frozen foods can be placed in the 'deep-freeze' compartment of a refrigerator within a very short time after purchase, they must be used the same day, or the following day at the latest.

WHERE A. F. D. SCORES

By contrast with Q.F., canned, or even fresh foods, the weight of A. F. D. material to be stored is only the weight of dry matter present in the food; the nutritive value and vitamin content are retained in the dry form to a remarkably high degree, as are the 'fresh' flavour and colour. The A. F. D. foods may be stored in the larder just like canned foods; in fact, temperatures well below freezing (such as are met with in Polar regions), which may damage or even burst canned foods have no effect on A. F. D. material. It will be readily

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seen that the savings in the costs of transport and storage of A. F. D. foods give them an important advantage over foods preserved by any other method.

In the kitchen, A. F. D. foods are very quickly prepared by pouring on hot water (for fruits or vegetables) or cold water (for meat or fish) and in some cases there is no other preparation needed—just drain and serve! Of course, the prepared food may then be heated or cooled as desired; in other cases a short (5–10 minutes) cooking period is advised. Steaks of meat or fish dried raw, however, require a

similar cooking period to their fresh counterparts. A. F. D., therefore increases the versatility of the contents of the larder, and gives plenty of scope to those who enjoy cooking; it also provides a means of serving tasty, nourishing meals in a very short time when required.

Almost any food may be dried by the A. F. D. process, the exceptions being fatty materials which contain very little water. Raw or cooked meats and fish may be freeze-dried with equal facility, and fruits or vegetables yield excellent products.

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Abolish Fisheries Corporation

Organise Fisheries Co-operative Federation!

V. V. Ravindran

(Mg: Editor, Fisheries Magazine)

THE Fisheries Corporation newly organised in Kerala is really harmful to the fishermen and their co-operative societies. Such a Corporation will be a stumbling block on the way of progress of the fishermen. India is aiming at the promotion of Industrial and labour sectors on co-operative basis and thus to improve the social and economic position of the working men; but unfortunately we see a contradictory approach in these lines in Kerala.

In Kerala, the Government was trying to organise new type fishermen's co-operative societies (MUCS) in order to improve the occupation and economic standard of the fishermen. As a result there are about 600 Fishermen primary co-op: societies and 6 Regional Marketing societies in Kerala. We cannot see such an attempt in other states in India. It is a bare fact that by organising Fisheries co-op: societies, that field of fish industry has been developed, as the agricultural sector has been promoted on the organisation of Service co-op: societies. So, the organisation of workmen's Co-operative societies is a prime necessity of a state which aims at the welfare of its working majority.

The Fisheries Corporation newly organised will demolish the Co-operative system in Fish Industry. There is no doubt that the Co-op: Societies of Fish Industry will be no more as

soon as the Corporation begins to function. At present the functioning of the Fishery Department has been stunted. The Fisheries Schools and Fish Curing Yards have been stopped. The officials of the Fish Curing Yards are deputed for fish monging business. Ice plants and other facilities of the Fisheries Department which were in the custody of Co-operative Societies on lease-system were handed over to the Corporation. Thus the rent amount due to Fisheries Dept. is lost. It is no wonder if fishermen think, by seeing this Corporation business, that the existence of the Fisheries Dept. is not at all a necessity in Kerala.

Just as Service co-op: societies in Agriculture sector and Khadi & Village Industry in Industrial sector, Fisheries co-op: societies on Primary and Regional basis and State co-operative Federation are to be organised for fishermen in order to improve the Fishery Industry and the condition of the Fishermen. State-wise Co-operative Federations of the Fishermen must be organised for the economic and social welfare of the fishermen; not a Fisheries Corporation. The new corporation means only a new company among other fish companies. Neither the fishermen nor fishery industry is going to benefit by this corporation.

Abolish this corporation and organise Fisheries co-operative Federation.

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FISHERY DEVELOPMENT IN THE FOURTH PLAN

T. Hariharan

Member, Central Fishery Advisery Board.

THE Fourth Five Year Plan has been framed and is now at the stage of finalisation. It is a colossal plan visualising an outlay of Rs. 21,500 Crores which may still further be increased. Fisheries should necessarily figure in this Plan. The investment for fisheries in the course of the three Plans amounted only to about Rs. 40 Crores. This amount has been too inadequate to make any impression on the economic life of the fishermen. The lethargy and stagnation associated with the coastal life are still there as of yore. There will be no change in this sad rhythm unless Planners provide for material resources for the development of fisheries.

India stands far behind even smaller nations at the tenth place in the production of fish. Even now, we are dependent on imports to meet our domestic needs. India can forge ahead if a sizable investment compatible with her capacity can be had for the development of her fisheries. Fish is important as food, as a dollar-earner and as a source of gainful employment. The out-put of fish remains low. The tackle now in use is generally of ancient pattern. The present rate of production can give only a semi-starving standard of life to the millions involved in it. Therefore the fishery development which is a robust factor in the economy of other nations like Norway still continues to drag on the Indian economic structure.

In order to increase production an ambitious programme to modernise fishing has to be formulated in the Fourth Plan. This main component of modernisation is the mechanised fishing craft. We require about 1,75,000 crafts to cover the requirements of about 17,50,000 fishermen living all along the coasts 3,500 miles in length. The investment involved for this item alone comes to Rs. 875 Crores. Other needs like health, housing, education, communications etc. also await attention on a gigantic scale.

Simultaneously with the development of Marine fisheries, equal attention has also to be paid to our inland fisheries. The question of adequate returns on investment is irrelevant in this context, as the development in the inland area is also a compelling necessity in view of the involvement of a considerable human element. Anti-sea Erosion measures require heavy expenditure without the prospect of any returns. All the same these measures are not put off on that score. Further, inland fisheries have also to discharge a role in fisheries very similar to that of the Thermal Plants regarding Power. When supply of fish and prawn ceases from marine sources, either due to rough weather or the freakish nature of fish-shoals, then we have to fall back on the inland fisheries to keep the processing plants going and the kitchens replenished. Certain varieties of very

rich fish can grow only in inland waters. Marine and inland fisheries together constitute the fishery wealth of India and they are supplementary to each other. The neglect of either one will ultimately harm the country at large in addition to the people involved in it.

In Kerala, fish farming was one of the items in the fishery schemes under the Third Plan. The fish farms in private hands constitute a major source of prawn, the Dollar-earner. Shallow areas are in plenty in the rich backwaters of this State that can be reclaimed for fish farm. The outer bunds of these farms can provide fishermen with house-sites as well. It is economic and therefore the investment is doubly justified. It has no limiting factor like the availability of foreign exchange. In spite of these favourable conditions, fish-farming has been dropped in Kerala. This is a folly that cannot be easily explained away.

During the Fourth Plan the inland fisheries of India including fish farms should get adequate attention.

Communications in the coasts constitute another factor that now stands in the way of the full development of Fisheries. Every maritime state should have a coastal highway and a network of link roads. This highway should touch every fishermen hamlet all along the coast. Incidentally it will connect the fish producing Centres with the Ports that are concerned with exports. The link roads will connect fishermen hamlets with the consuming areas in the hinterland of each state. Much of the precious fish caught in the bumper seasons often go to waste as manure even now in areas that are not served with link roads. Fair returns are also dependent on communications. Nayarambalam and Munambam are two fishermen hamlets only 8 miles apart in Vypeen Island, Kerala. Nayarambalam has no road link while Munambam

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When ten baskets of Sardines fetch about 100/- at Munambam the price at Nayaram is only just its half. Accessibility is an important factor to bring better returns to fishermen. Inland States also should provide link roads to connect the hamlets to the nearest main road, market, railway station and other transport points. The crash programme provided in the course of the Third Plan has improved the position regarding communications. This aspect has to be specially attended to in the Fourth Five Year Plan.

Thus, a cursory glance in the Fishery sector will show the dimensions of the investment required to make our coast also to fall in line with the general development in the country. It was in this light that some of us were shocked when the allocation in the Fourth Plan was proposed at Rs. 114 Crores. Arithmetically it may be a spectacular leap from the Third Plan but factually it is an allocation inadequate to the core to tackle the mighty problems in this sector. The country is thinking in terms of a National Plan with an outlay of Rs. 21,500 Crores. The main stress in this Plan is correctly given to Agriculture. Fisheries form a part of agriculture. As such, a fishery plan has to be thought of in terms of investing at least Rs. 1,000 Crores. It is not too much in relation to the overall plan. To pierce the crust of backwardness that stifle the growth of fisheries and fishermen in the coastal belt of India, the power-drill of reasonable allocation has necessarily to be applied.

In the course of the working of the three National Plans, certain hurdles were seen standing in the way of the development of fisheries. The main hurdle is the non-availability of sufficient foreign exchange to implement the full programme of mechanisation. This difficulty will again come up in the course of the future Plans also if arrangements are not made to manufacture Marine Diesel Engines in India itself. Immediately, countries like Germany,

Norway, Japan etc. have to be sounded for collaboration to start this industry indigenously. I trust steps will be taken shortly to solve this problem.

Another hurdle that stood in the way of peak production was the lack of workshop and non-availability of spare parts in the fishing centres. A crash programme has to be prepared to start efficient service stations and well stocked stores for spare parts at every point of production. The Indian Oil Co., has also to be requested to instal their pumps at those points to supply oil needed for the mechanised boats.

The poor quality of the training now imparted to fishermen at the Fishery Training Centres of the States is another factor that stands in the way of better production. These trainees have at present no proper grip on the mechanism of the Engines. It results in rough handling, impairing efficiency. Many fishing boats consequently have been out of commission when the season is in full swing. Quality of the training is a pre-requisite for the proper development of fisheries.

The policy adopted now in the distribution of Marine Diesel Engines is very unscientific. It has to be altered in the light of the actual type of fishing in vogue in each State. Now, Engines are granted to the States on the basis of requisition placed by each State. A 32 footer boat with its engine roughly costs about Rs. 45,000/-. For trawling, such a boat with this much of horse power is a necessity. But in craggy coasts, trawling is impossible. There, gill-nets, drift nets and hooks and lines are used. For these type of fishing it is enough to fit out-board engines to the country crafts. In Catamaran belts, new hulls fitted with out-board engines will suffice. An out-board engine may at the most cost only about Rs. 3,000/-. In view of this difference in costs the policy regarding distribution of marine engines has to be revised. Marine Engines shall be distributed

only to trawling belts, which are well defined by the experts of oceanography. This is a step required in the interests of better and more profitable utilisation of the available resources.

Lack of inter-departmental co-ordination is another factor that now stands in the way of development. In Kerala, under the Second Five Year Plan, guide lights were put in some hamlets. Some of these lights are not commissioned even now due to the lack of co-ordination between the departments of Fisheries and Electricity. Approach roads constitute another casualty due to the stepmotherly attitude of the Department of Works to the fishery needs. Public Health also is notorious for their supreme importunities of the coastal area. The most glaring example of this lack of co-ordination is seen in the coastal N. E. S. Blocks. Coastal Blocks occasionally devise their own fishery schemes with their funds. Technical sanction has to be given by the Fishery Department. Often this is refused. In the Vypeen N. E. S.

Block, Ernakulam District, Kerala, several schemes were framed and submitted. Technical sanction was refused in most cases. Neither alternate schemes were suggested by the Fishery Department. A method by which the representatives of fishermen in the Block, the Officials of the Block and the District Fishery Officer can sit together to frame the Schemes has to be devised. These Schemes should be given the green signal automatically in the interest of the development of fisheries.

Boat-building is another factor that has to be carefully planned. Mechanised fishing crafts will figure prominently in the development of fisheries. The number of these crafts have been doubled to 8000 in the Fourth Five Year Plan. The hulls of these boats as much as the engines should be in prime condition for the efficiency of fishing as well as the safety of fishermen. These hulls are now constructed by contractors. Their motive is not philanthropic but profit-making. If they stick to specifications, their

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gains will be slender. Therefore short-cuts are made by propitiatory methods. A strict recheck of the boats released to fishermen will prove the extent of this danger. Boat building has to be taken out of this vulnerable and vicious system. It has to be entrusted to a set-up answerable to fishermen whose lives depend on well built boats. A co-operative body has to be thought of for this specific purpose to form part of the general fishery co-operative structure.

Modern Fishery development is mainly based on fishing ports instead of fishermen-hamlets. A disruptive element is inherent in this policy. Fishermen have to leave their hamlets and congregate for mechanised fishing at these distant ports which are few and far between. This will ultimately lead to the dissolution of these hamlets. It will further bring in a nomadic element in the life of fishermen. A way has to be thought to avert this disaster which the coastal areas now face. Provision of slip-ways for a group of hamlets at important points in the coast has to be thought of. The out-lay needed to develop a fishing port is really exorbitant. Therefore the economics and the feasibility of the slip-ways merit examination. The ingenuity of our experts will be able to solve this problem. Once it is made possible to conduct fishing operations with the hamlet as the base, fishery industry can be developed evenly all along the coast, making the entire belt prosperous.

Research is another factor that has to be oriented to the actual and immediate needs of Fishery development. From ancient days light in the form of crude torches has been incorporated in fishing. Our Scientists have not further explored the potentiality of light in luring and catching fish. Different textures of light have to be tested for its luring capacity. During monsoon days our seas are rich in fish but rough weather places it beyond the reach of fishermen. Is it possible to attract fish by means of light to the safety of lagoons for easy catch? What

improvements in lighting can enrich fishing by stake-net and China nets?

In Kerala hundreds of China nets are operated even now in its ancient crude form. Logs and heavy stones, dislocation of which often prove fatal are used in its make up. Intense physical labour is also involved in it. Can incorporation of Aluminium pipes and electricity make its operation easy, smooth and more civilised?

During monsoon periods shoals of fish come to the harbour mouths to feed on matters brought in by the flooded rivers. What is this feed? Can it be artificially manufactured so that by sowing it in the waters, fish can be attracted to the shores in all seasons? Can other feeds be improvised so that we can prevent fishes like Sardine and Mackerel from migrating from our waters?

What is the method by which the life-span of craft, net and other tackles can be doubled?

By incorporating cement pipes and other structures, can fishing grounds for angling be made artificially at the required points?

Fishery research should be able to answer identical questions posed by a fisherman. Fixing the age of a Sardine by counting the ring on its scales and other allied pedantic exercises may safely be left to the learned and leisurely fraternity attached to our Universities. The Scientists in the Fishery Institutes instead of wasting their time on tedious theories should bring in a sense of urgency and realism to answer questions and solve problems necessary to work out a normal human standard of life in the coastal belt of India. This is the least that a socialistic nation like India demands of her fishery Scientists. Our Scientists have to be taken out of their Purdha and brought face to face with fishermen and their problems. Then alone fishery research will become attuned to the growing needs of fishery development. An

official forum has to be created for the Scientists and the representatives of fishermen to meet occasionally to exchange ideas. The findings of the Scientists and the needs of the fishermen can be discussed in that forum to the mutual advantage of both.

In view of the growing dimensions of fishery development from plan to plan, the departmental machinery at the Centre and the States to be suitably redesigned.

There should be a separate department of fisheries under the Union Ministry of Food and Agriculture. Of the personnel in this department, there should be a top official to attend to co-operative development of fisheries and socio-economic affairs. Technical men who are in charge of fisheries are not trained to care for the human element which is the main reason for

deadly deviations we notice in the fishery sector. There should be a senior Research Officer with a Cell under him in the Yojana Bhavan to work out the need of fishery development. These Officers should be qualified ones drawn preferably from the way of life associated with fishing which is necessary to keep fishery development within the guidelines prescribed by the Planning Commission. Proper persons are there working in the different Ministries of the Union Government.

In the States also, the Departmental machinery has to be rehauled. Officers there are tethered to Revenue work. The very character of the department now cocooned in the pre-Independence ways should be changed to suit the requirements of a socialist economy. The department should be mainly concerned with co-operative development of fisheries and the welfare of fishermen. The very attitude and



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approach of the departments require change. Fishermen are human beings allergic to disdain. They will gladly respond to a considerate treatment which has yet to come.

In this connection a suggestion requires to be examined. A way of life is associated with fishing as in agriculture. An educated person with the requisite qualifications drawn from this way of life will be an ideal Fishery Official. He will bring in a burning sincerity in the discharge of his duties and be more responsible in implementing a socialist policy. He will be free from the superiority complex now common in the fishery cadre. The first Fishery Ministers' Conference held at Bombay in 1957 recommended that duly qualified persons from the fisherfolk should be preferred for appointment as fishery Officers. Now there is the Fishery Officers' Training Institute at Bombay. The States have to be requested that at least half of their nominees to this Institute are drawn from the way of life associated with fishing.

Responsible persons associated with this way of life have to be given opportunities in the formulation and implementation of the Fishery schemes at the Central, State, District and Block level. In spite of the recommendations of the Bombay Conference of 1957, many States have failed to give representation to fishermen with the respective advisory bodies concerned with planning and development. Kerala which stands in the vanguard of other States in the production of fish has not seen her way to give representation to fishermen in the State Planning Advisory Board and District Development Councils. Many coastal Blocks have no representation of fishermen on their Advisory Committee. Fishermen being the weakest section in India, their representative have not been returned

either to the Parliament in the Centre, or the Legislatures in the States to assert and drive home the claims of fisheries. Even in the Panchayati Raj, fishermen do not get any opportunity as influential sections score away elective positions. Therefore the representative of fishermen have to be deliberately given opportunities in the different forums by the Planning Commission and the Government (both the Centre and the States) by exercising their power of nomination. If this is not done, fishery development can never be fishermen-oriented.

A panel on fisheries has to be created jointly by the Planning Commission, Ministry of Food and Agriculture, as well as the Ministry of Community Development and Co-operation. Representatives of fishermen should form the majority in this panel on the pattern of the panel on agriculture. This panel should be charged with the task of advising the Government on the formulation and implementation of their policy on fisheries. It should be made possible for the members of this panel to tour the States to study the problems of Fisheries from a national angle. Farmers get this opportunity in spite of the presence of their representatives in the Parliament and technical men in the Planning Commission and the Agricultural Ministry. In the interest of the development of fisheries on proper lines, this suggestion requires to be accepted. The Central Fishery Advisory Board can never be a substitute for this panel on two counts. It is mainly composed of State Fishery Ministers so that the very few representatives of fishermen get only limited opportunity to express their view point. Secondly it seldom meets. The last meeting came off after an interval of 18 months.

QUALITY CONTROL & CUSTOMS

A recent instance in which the Customs Authorities questioned the validity of the Pre-shipment Quality Inspection Certificate has thrown up the question as to who is the ultimate authority in regard to Quality Control.

A consignment of Canned shrimp was recently sent to the wharves for shipment. The Customs Officers deputed for examination of the cargo opened a few tins and alleged that the grades found in the tins differed from those declared on the shipping documents. The exporter explained to the Customs Officials that there was no difference as alleged by them and that the contents represented the exact grade as certified to by the Quality Control Authorities. He also explained to them that the grade could not be determined merely on the basis of appearance and that there were other conventional and accepted methods. Refusing to accept the position they insisted on a further verification by the Chief of Quality Control.

While the exporter lodged a protest the Customs Officials drew samples and sent them to the Quality Control Chief for remarks. The Chief of Quality Control, needless to say, rejected the Customs Officers' contention and

confirmed that the grades conformed to the declaration on the shipping bills. Ultimately, the shipment was passed, but not before the exporter lost one month of precious time !

This incident, apart from the harassment caused, raises an important issue as to whether the Customs Officials were acting within their jurisdiction by insisting on a further verification by the Quality Control Department. The need and propriety of the Customs Officials examining the goods awaiting shipment is not sought to be questioned. But when Customs Officials who have little or no knowledge concerning quality, question the validity of certificates issued by experienced and competent officers deputed for the purpose, we believe it becomes an unwarranted interference.

This case has, therefore, been brought to the notice of the Marine Products Export Promotion Council and the Quality Control organisation for clarification. It is hoped a position in which certificates issued by a competent department will be passed without question by another department at the shipping stage would emerge in future, thereby avoiding unnecessary victimisation of exporters.

Continuous Quality Control Inspection

AT a meeting held under the auspices of the Marine Products Export Promotion Council where Dr. C. N. Modawal, Director of Quality Control, Government of India, New Delhi was present, the proposed scheme for continuous inspection for Frozen and Canned Fishery Products and Frozen Froglegs were discussed.

Following is the procedure suggested to be followed for implementing the continuous (inplant) inspection:-

1. Necessary Inspecting Officers will be posted to each Factory or a group of Factories (in case they are conveniently situated close to each other) to ensure continuous inspection.
2. The Inspector posted to the Factory shall examine all raw materials (including cooked Shrimp) brought into the factory for processing. In the exceptional event of the Inspector not being available to examine the goods immediately on arrival, they may after due inspection by the processor and if found fit, be used on the processing lines, subject to the fact being subsequently brought to the notice of the

Inspector, his being satisfied about the soundness of the materials. If the material is not upto the mark, it shall not be processed, but destroyed or removed from the factory.

3. In case the processor does not agree with the decision of the Inspector, such material may be held, for appeal-inspection by a designated Officer of the Department who may be either the Senior Research Officer or any person of comparable rank, whose decision will be final. In such cases, if no immediate decision is possible, the material may be allowed to be processed by the Inspector and kept separately, duly marked for detailed examination later on.
4. Every factory shall maintain a register showing full details of the raw material received, viz., (a) quantity purchased, (b) time of arrival, (c) Source of supply, (d) species, and (e) type. The Inspector after verification and examination as in para 2 above shall initial the register and record the

details of the inspection in a log book to be maintained by him, in the form prescribed by the Inspecting Authority.

5. The material under processing shall be subjected to further examination at different stages of handling and processing. During such inspections, random samples shall be checked for size, grade, drained weight, etc. as also for their physical and organoleptic quality. Separate log books will have to be maintained for recording all these details by the Inspector.
6. The Officer shall in addition, note down the total quantity processed, the code numbers, etc. so that a correlation could be worked out between the raw material received and the quantity of finished product.
7. The Inspector shall have the right to draw samples from the finished product for a final analysis of the quality. But such samples shall not be more than 0.01% of the quantity.
8. At all these stages of inspection, if the whole or a portion of the material is sub-standard, such sub-standard materials shall be treated as rejected and disposed of as detailed in para 2 above.
9. The finished material duly passed shall be sealed with a seal provided for the purpose by the concerned authorities.

10. Goods inspected and passed in the above manner shall have on them declaration to the effect that they have been processed under continuous inspection by Government agencies. Certificates will be also issued by the Inspecting Authorities as and when required by the processors in writing.

11. The Inspector shall have the right to draw and examine samples of goods processed and kept in the Factory in order to ensure that, due to power failure or other causes, the quality of the product has not been adversely affected. Such examination will, however, be done only with the prior permission of the Inspection Authority.

Shri K. Damodaran, President, Indian Seafood Exporters Association, represented that the proposed in-plant inspection should be purely on a voluntary basis for a trial period of 3 months and no immediate Gazette notification should be issued. While the existing inspection scheme may be continued without any alteration, the Council should review after 3 months the progress on the voluntary in-plant inspection now introduced. The Sub-committee agreed with the suggestions of Shri K. Damodaran and also decided that the scheme may be circulated among all the Panel members.

KERALA FISHERIES CORPORATION

LOSING GROUND

THE Managing Director of the Kerala Fisheries Corporation who was accusing the porters with misuse of the Incentive Import entitlements and who was pronouncing that the Corporation will earn incentives which will be utilised for the benefit of the fishermen has miserably failed in his ambitions as the incentives are now abolished by the Government of India under the Devaluation Scheme.

This major setback suffered by the Corporation even before it started its activities could serve as an eye opener to the Promoters of the Corporation, whose arguments have no standing under the changed circumstances. It is hoped that the whole affair of the Corporation will now be subjected to a rethinking by the Government.

India Govt. to Shelve Fisheries Corpn.

According to latest reports, the Government of India have decided to shelve the Fisheries Corporation they have proposed to form in collaboration with a foreign firm allowing more than 50% capital to the collaborators. The Indian Seafood Exporters Association was opposed to this corporation also. Public opinion was also not in favour of such corporations. This decision of the Government is sure to help to relieve the doubts and anxiety prevailing in the Seafood Industry which is full with news of Central and State level corporations.

Will the Kerala Government be guided by the step taken in the right direction by the Government of India?

Marine Products Export Promotion Council

To put up Ice Plant & Cold Storage

THREE years ago the Marine Products Export Promotion Council took a decision to put up an Ice Plant and Cold Storage in the Willingdon Island, where the Cochin Harbour establishments are situated. But the then Director of Fisheries of Kerala State Shri A. I. George assured the Council that the Government of Kerala can take up this job since they have sufficient funds at their disposal. It was therefore left to the Government of Kerala to put up the Ice Plant and Cold Storage. But nothing was done by the Government of Kerala and the proposals remained unfulfilled. Shortly after proposing this project Shri George

relinquished the Office of the Director of Fisheries and Shri Gopinatha Pillay took over as Director. As is well known Shri Gopinatha Pillay was more busy with the formation of the Fisheries Corporation than the urgent needed Ice Plant and Cold Storage.

The Meeting held by the Marine Products Export Promotion Council on 16-6-66 where Dr. C. N. Modawal, Director of Quality Control, Government of India was present, took a unanimous decision that the Marine Products Export Promotion Council itself should start a 200 tons Ice Plant and 500 Tons Cold Storage at the Willingdon Island.

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U.S.A. SHRIMP MARKET

SHORTAGE of large shrimp continues in the United States so that prices continually rise upward. New highs are constantly being reached for both the peeled and deveined shrimp and the shell-on headless shrimp. The catch in the Gulf of Mexico has not yet developed and it would appear that the shortage of large sizes will continue for at least another month. Since some small catches are beginning to be reported in Louisiana, it is expected that within four or five weeks significant catches will develop and the price on the large shrimp could then retreat.

The smaller sizes are quite weak. The Green Sheet is now reporting prices for 130/ups of 73 and 74 cents a pound against prices around

80cents a pound three weeks ago. This sharp drop has been caused by large unsold inventories in that country. Several of the large importers have 2000 to 3000 cases on hand at the present time. Many of these small peeled and deveined shrimp are used during the summer months and therefore the consumption is expected to be at a high level during the next few months, and therefore there is no reason for the prices to fall further although the weakness of the last month has been upsetting the market.

The economy of the United States still remains very strong and therefore shrimp consumption is going at a very high rate.

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KERALA STATE - INDIA

Supply and Disposition of Domestic and Imported Heads-Off Shrimp in U. S. A. during 1960 - 1965

<u>Item</u>	<u>1965</u>	<u>1964</u>	<u>1963</u>	<u>1962</u>	<u>1961</u>	<u>1960</u>
<u>Supply:</u>	(In Thousands of Pounds)					
Domestic catch	153,200	133,114	150,737	119,154	103,865	147,976
Imports	178,902	169,510	167,344	152,504	134,564	113,418
Total	332,102	303,278	318,240	271,959	238,429	261,394
<u>Disposition:</u>						
Canned	42,712	26,832	42,483	35,604	24,872	34,510
Dried	4,381	3,043	3,543	2,069	2,722	1,790
Frozen	266,860	254,895	250,799	214,693	196,524	203,201
Fresh	16,352	15,723	16,981	15,723	14,286	26,200
Unclassified	2,197	2,785	4,434	4,469	25	—
Total	332,102	303,278	318,240	271,959	238,429	265,701

SUPPLY OF SHRIMP-HEADS—OFF—IN U. S. A. DURING VARIOUS YEARS

(In Thousands of Pounds)

	<u>U. S. A. Catches</u>		<u>Imports</u>		<u>Total Quantity</u>
	<u>Quantity</u>	<u>Percentage</u>	<u>Quantity</u>	<u>Percentage</u>	
1948	99,365	82	21,563	18	120,928
1950	113,927	74	40,198	26	154,125
1952	135,251	78	38,471	22	173,722
1954	159,723	79	41,519	21	201,242
1956	133,436	66	68,618	34	202,054
1958	127,287	60	85,394	40	212,681
1960	148,483	55	119,139	45	267,622
1961	103,865	44	134,564	56	238,429
1962	119,154	44	152,504	56	271,658
1963	150,244	47	167,344	53	317,588
1964	133,114	44	169,510	56	303,278
1965	153,200	46	178,902	54	332,102

NEWS & NOTES

Marine Council Postpones Election

The Marine Products Export Promotion Council decided to postpone the election to fill the seats falling vacant this month to enable the Council to obtain legal advice on the validity of the Nomination Papers filed by the Quilon and Alleppy Exporters for the Malabar and Calicut seats, respectively. The matter has been referred to the Advocate General of Kerala State, whose advice is awaited.

Poysha Offers Shrimp Cans

The Poysha Industrial Company Ltd., Bombay, one of the leading Can manufacturers in India have offered to supply S. R. Lacquered Shrimp Cans to the Fish Canneries. This firm is also making preparations to put up a can manufacturing unit near Ernakulam. So far the can supplies to Fish canners was a monopoly of the Metal Box Company.

New Members of ISEA

The following new members were admitted to the Indian Seafood Exporters Association:-

1. Rainbow Cannery, Power House Road, Ernakulam - 8.
2. Indian Aquatic Products, Sakthikulangara, Quilon - 3.
3. Cherian & Kuruvila, P. B. No. 208, Alleppy.

Correction

In our May issue in the News and Notes column in page 23 the name of Shri Nazareth appeared wrongly. It is Shri S. Magnus, the Managing Director of M/s. Metallica Works (P) Ltd., Bombay who is on a visit to U. S. A. The error is regretted.
— Editor

Shri J. R. K. Menon-returns from U.S.A.

Shri J. R. K. Menon of M/s. Pisces Corporation, Ernakulam, who was on a visit to U.S. A. to study the market conditions and to negotiate for importing machinery to expand his business returned recently after successfully negotiating with leading U. S. A. firms.

Mysore Government Fisheries Department Launches Refrigerated Truck

The Mysore Government Fisheries Department recently launched HIMAGAURI, their refrigerated truck.

Fishery Industry in Priority List

Fish Preserving, Sanitary can making and Fishing Boat building have been brought under the "Priority Industries" for purposes of liberalised imports, according to an announcement made by the Government of India.

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JULY 1966

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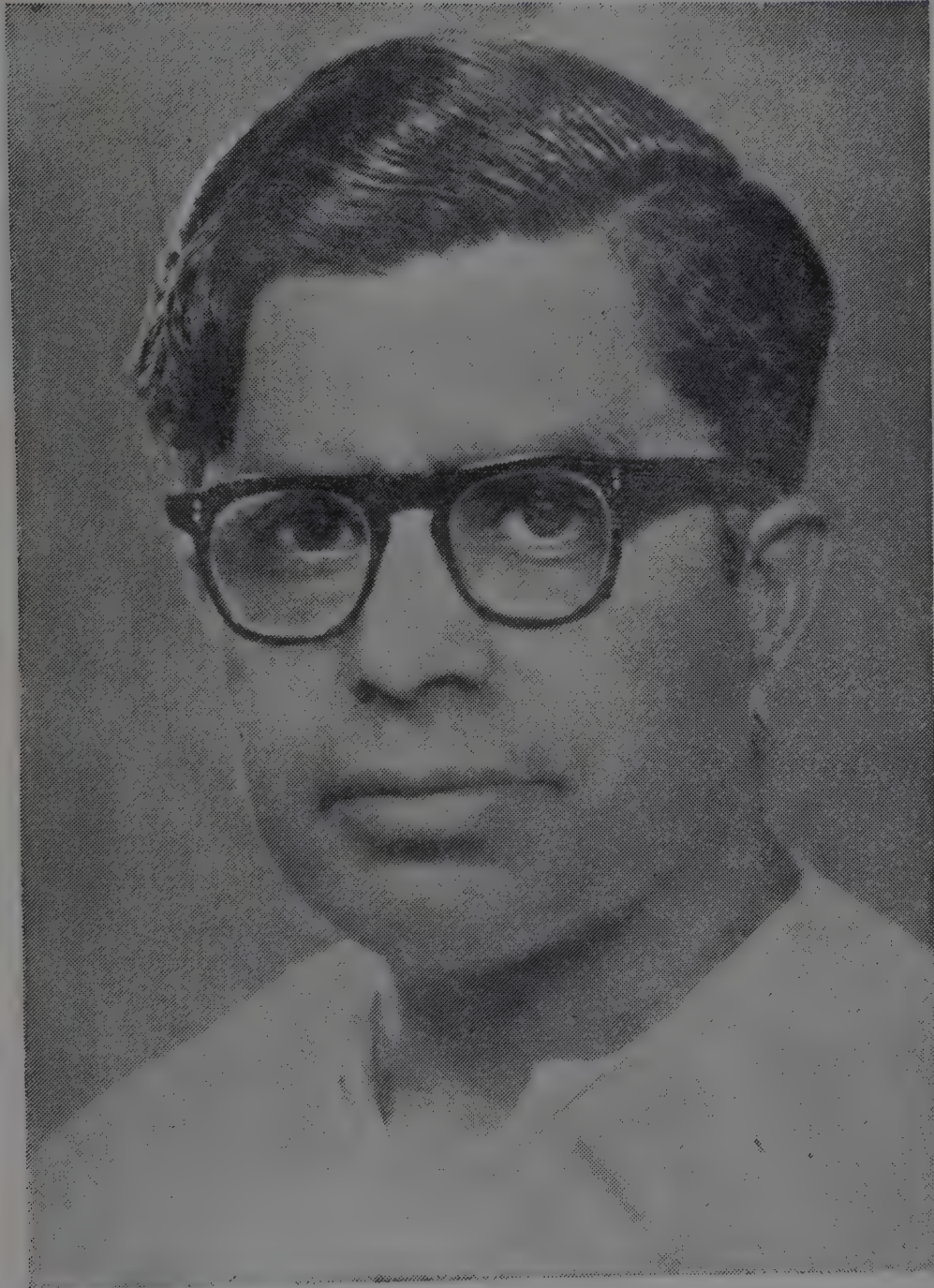
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21st July, 1966

Mr. Kurwath Damodaran

President

The Indian Seafood Exporters Assn.

2nd Floor

XII/322, Jew Town Road

Cochin - 2

Dear Mr. Damodaran,

I thank you for sending us a copy of the June issue of our journal 'Seafood Exporter'. The journal has been well brought up and a few of the topics discussed in the issue are very pertinent and some of the articles also contained very valuable information for the industry as a whole.

It is my feeling that the journal is bound to serve the cause of the industry.

With best wishes.

Yours sincerely,

(Sd.)

John P. George

ly, 1966

Seafood Exporter

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K. P. S. Menon

Editor.



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CONSEQUENT upon acute shortage of ice supplies, the Seafood Exports are adversely affected to a very great extent. With the present heavy catches the prices of ice shot up to an unprecedented level.

While the Government's slogan "Increase your Exports" remains, it is unfortunate that an export trade like Seafoods with a creditable performance should have been allowed to suffer for want of essential amenities like ice. It is pertinent to point out that there was a proposal to put up an Ice and Cold Storage Plant on Willingdon Island under the auspices of the Marine Products Export Promotion Council, three years ago. Apparently it was shelved because the Kerala Fisheries Department planned to construct plants of their own. Since the matter remained in "cold storage" for quite a long time, the Marine Products Export Promotion Council again took it up and decided to put up ice plants without delay. However, when the proposition came up for consideration by the Administrative Committee of the Council, the Director of Fisheries, Kerala, assured the Council that the Kerala Government had already started addressing themselves to the task. For the second time, therefore, the Council dropped the proposal.

In our view regardless of whether or not the Kerala Government had proposals for constructing ice plants, the Council should have gone ahead with its own schemes in the interests of the exporters. Admittedly, ice & cold storage plants are a necessity to the exporters and the Council had its obligations to meet the needs. Therefore, instead of dropping the proposal altogether not only once, but twice, the Council should have gone ahead with its scheme. May be, it was preferable for the Council to think in terms of making a smaller plant available and at a place other than Willingdon

Island where the Government of Kerala or, for that matter, the Kerala Government Fisheries Corporation, proposed to locate their plant.

It must, in this connection, be emphasised that the Kerala Government Fisheries Corporation has started its own freezing operations. Obviously, therefore, private exporters are not likely to be benefited from the Kerala Government Ice Plants. At best the new ice and cold storage plants proposed to be set up by the Fisheries Department would only meet with the same fate which overtook the ice and cold storage plants belonging to Kerala Government which were taken over by the Corporation. Under these circumstances, we strongly urge that the Marine Products Export Promotion Council should implement its original decision to have its own ice and cold storage plants.

While on this subject, mention must be made of a number of ice plants which, though completed, remain idle for want of power connections. The power-cut in the State is a thing of the past and yet it is amazing that the new plants have not yet been provided with electricity. The useful role that these new plants could play in meeting the present acute shortage of ice cannot be underestimated and it is therefore, the duty of the authorities concerned to give power-connections to these plants on a high priority basis. We hope and trust that this matter will be given the urgency it deserves and that the new plants all over the State will start functioning sooner than later.



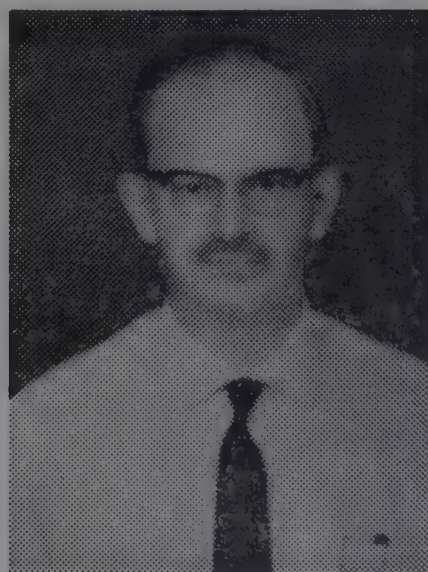
Freeze-Drying

—THE NEW FOOD PRESERVING METHOD

C. G. TUCKER, B. Sc. (London), F. I. C. I., F. I. F. S. T., M. B. A. C.,
F. A. O. Expert,
Technical Adviser on food processing to Irish Sugar Co. Ltd.

The Author, whose article on the same subject appeared in our previous issue, writes in this article on the Technical Aspects of this process.

THROUGHOUT the world large amounts of food are preserved by drying, either naturally by sun and wind, or artificially by evaporating the water content under controlled conditions. An ideal method of drying a food material should involve the removal of its water content reversibly, (that is, it should be possible to restore the water content to its original level when required), and should cause no change of flavour, texture, appearance, or nutritive value; no method has yet completely realised this ideal. The latest technique and the nearest to the ideal removes the water from the foodstuff while it is in the frozen state—hence the name “freeze-drying” given to this method.



It is of course well known that water, when exposed to air, evaporates, that is, changes from liquid to vapour. It is perhaps not so well known that water in the frozen state (ice or

snow) can change from solid to vapour *without melting*, under suitable conditions, and it is this property (known as sublimation) which is employed in freeze-drying. Scientists have known of it for at least 150 years, but the first record of an attempt to dry frozen material dates from 1909, when L. F. Shackell published a paper in the American Journal of Physiology, under the title "An improved method of desiccation, with some applications to biological problems". He froze his material (biological tissues and fluids) by means of an ice / salt mixture and placed it in a vacuum desiccator over concentrated sulphuric acid, which absorbed the water vapour coming from the frozen material. Drying was slow by this method, but effective; it was of course necessary to prevent the material from thawing during the drying period. Later workers introduced modifications of Shackell's technique, and by the middle 1930's quantities of serum were being preserved by freeze-drying in Philadelphia (U. S. A.), Cambridge (U. K.) and elsewhere. The work was stimulated by the threat of war, and soon relatively large amounts of blood plasma and other medical requirements were being stored. Accounts of this work have been given by R. I. N. Greaves ("The Preservation of Proteins by Drying", published by H. M. Stationery Office, London, 1946), by E. W. Flosdorf ("Freeze - Drying", published by Reinhold, New York, 1949), and others. The material was generally dried in small quantities in batches of ampoules, and drying was slow (up to two days). The products were usually porous solids with a great affinity for water, whence the process has been called "lyophilisation", particularly by French workers.

As is well known, when water containing dissolved or suspended matter is frozen, the ice

formed first is pure frozen water, which separates from the liquid until a certain concentration known as the cryohydric point is reached, when the whole solution solidifies. Though it is an over-simplification, we may consider frozen biological tissues (including foods) as series of cells enclosing ice, through which are dispersed precipitated solutes and colloids; if the ice is removed by sublimation (as in freeze-drying), the "skeleton" of cell walls remains, retaining the original shape and size of the tissue, irrespective of temperature; when the material is dry (that is when no more ice remains) it can safely be stored at temperatures above freezing. On the addition of water, the original appearance is restored, hence the importance of the method for food preservation.

If a slab of frozen meat or fish muscle of uniform thickness is subjected to the freeze-drying process, the ice will sublime from all surfaces and the ice front will recede into the material, leaving a dry lattice of cell walls through which the rest of the sublimed vapour must pass. Drying is complete when all the ice has sublimed; but if the material is removed from the dryer before this stage is reached, and the remaining ice is allowed to thaw, the result is a piece of meat or fish dry in the outer layers but completely undried in the centre, of which the storage life will be only that of the unprocessed material. In other words, freeze-drying to be effective as a means of food preservation must be continued until *all* ice has been removed; there is no satisfactory way of stopping drying at an intermediate level of, say, 10% moisture content. To ensure this complete drying, there was a tendency among early workers to use unnecessarily long drying times, and it soon became obvious that means of shortening the

rying time must be found if the process was to be economically successful. The problem resolved itself into a search for more efficient means of removal of large volumes of water vapour and for better means of replacing the latent heat carried away in the process.

At this point it is necessary to consider the physics of the freeze-drying process. Water in the liquid state or in the form of ice, whether pure or in a water-containing material, exerts a vapour pressure the magnitude of which depends on the temperature. If this vapour pressure is greater than the partial pressure of water vapour in the ambient atmosphere, evaporation will occur, accompanied by an absorption of heat (latent heat of vaporisation), which is drawn in the first instance from the water, causing a fall in its temperature; the heat loss may then be replaced from the environment, and a point of balance will be reached at a temperature at which the vapour pressure of the water is equal to the partial pressure of water vapour in the ambient atmosphere, and evaporation will then cease. If however the water vapour can be removed from the system as fast as it is formed, and a supply of heat to the material can be arranged, evaporation will continue until all the free water has been removed. At 0°C (32°F), the vapour pressure of water or ice is a little over 4.5 mm. Hg; in an atmosphere with a partial pressure of water vapour less than this, ice can sublime directly without melting. It is under such conditions that freeze-drying can occur. A convenient way of ensuring removal of water vapour from ice is to enclose the frozen material in a chamber which is evacuated to an absolute pressure less than 4.5 mm. Hg.

At 0°C (32°F), the latent heat of vaporisation of ice is 1072 B. Th. U. per pound (595 kcal per kg.); at this temperature and under an

absolute pressure of 4.5 mm. Hg. one pound of water vapour occupies 3385 cubic feet (one kg. occupies 95.64 cubic metres). Rates of evaporation up to 1 lb. per hour per square foot of dryer tray surface (4.9 kg. per square metre) may be incurred in commercial freeze drying, and a drying chamber may contain perhaps half a ton (500 kg.) of food of which 80–90% is water, so that some idea of the size of the problem may be gained.

Removal of water vapour in freeze-drying has been accomplished in a number of ways—by chemical absorption, by condensing on a cold (refrigerated) surface, by mechanical pumps, by jet ejector systems etc. Each method has its own advantages and disadvantages, and in commercial practice only two have proved successful; these are the multiple steam-jet ejector with water spray condenser, and the mechanical vacuum pump with refrigerated condenser. In each case the issuing water vapour is reduced in volume and condensed; in the former case the condensate is removed from the system continuously in the liquid form, but if the refrigerated condenser is used the water vapour is condensed as “frost” on the cold surface and must be removed when the drying operation has been completed. The choice of method in a particular case depends on such factors as availability, cost, and temperature of cooling water, comparative costs of fuel and power, etc. The refrigerated condenser/mechanical pump system has a higher capital and maintenance cost, higher power consumption, and larger space requirement; the steam ejector system may be lower in capital cost, low in power consumption (zero in certain cases), but uses more steam and cooling water.

The rate of heat transfer to the material has a major influence on the drying rate if vapour removal is adequate. Convective heat transfer is slight at the low pressures used, and conduction and radiation are the main agents, with microwave or dielectric heating as a future possibility. Whatever method is used must be capable of precise control to avoid thawing and scorching of the material. If there is direct contact of the heating surface with the material being dried, there is a risk that free escape of water vapour will be hindered with the result that thawing will occur; on the other hand if there is free vapour removal there cannot be full contact for direct heat conduction. This problem was solved by the invention by scientists of the British Ministry of Agriculture of their accelerated freeze drying (A. F. D.) system, in which sheets of "expanded metal" are interposed between the heating surfaces and the food; these provide many points of contact, while at the same time ample channels are left for vapour removal. This work was described in "The Accelerated Freeze-Drying Method of Food Preservation", published by H.M.S.O., London, 1961.

Radiant (infra-red) heating systems do not suffer from this difficulty of vapour removal since the heating surfaces do not touch the food, but care must be taken to avoid overheating the dry surface of the material, and longer drying times may be involved than by the A. F. D. method. On the other hand, radiant heating equipment is generally less costly and more simple than the A. F. D. type, and is increasing in popularity on this account.

A truly continuous freeze-drying equipment for foods such as meat and fish has not been

produced; semi-continuous tunnel-type plants have been designed, which are economic for large throughputs of say 50 tons per day or more. The most usual type of plant employs a series of batch-type chambers coupled to a common vacuum system. A single-chamber plant is usually installed only for pilot-scale work as it is wasteful in its use of labour; the preparation staff could be employed for only two or three hours daily. Some form of quick-freezing and cold storage is an essential adjunct to a freeze-drying plant, for preparation of the material for drying, but the dry product may be stored at ambient temperature, though it must be packed in a container which is impervious to light, water, and oxygen if its maximum potential storage life is to be attained. This storage life is measured in years in a temperate or cool climate, and in months under tropical conditions.

The cost of water removal by freeze drying is appreciably greater than by hot-air drying, and the capital cost of the equipment is high. These higher costs are justified if a premium price can be obtained for high quality and / or long storage life on a costly raw material. The quality of the product is such that it can be compared to the *fresh* material; it is in an entirely different class from materials dried by other methods. The low cost of transport and absence of special storage requirements are of great advantage and can to some extent offset the higher drying costs.

Certain special factors applicable to the freeze-drying of raw fish may be mentioned. The skin of the fish does not allow water vapour to pass readily; evaporation is much easier from a cut muscle surface, and is most rapid if the cut

at right angles to the muscle fibre direction. Hence whole fish or fillets dry less readily than "steaks" cut at right angles to the backbone. This limitation is less important if the fish is cooked before drying, since in this case there is some breakdown of the structure which assists water removal. Shell-fish such as prawns must

be deshelled before drying, both to assist the process and to increase the payload of the dryer; they may be dried raw or cooked, and in the latter case the dried prawns are ready to eat after immersion in water for only one minute. In this form they are very popular in U. S. A. and other countries where they are produced.

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On some Factors Controlling THE QUALITY OF FROZEN and CANNED FISHERY PRODUCTS

Dr. V. K. PILLAI, M. Sc., Ph. D.
Senior Research Officer,
Central Institute of Fisheries Technology

IT goes without saying that only a good raw material can result in a good processed material. This is more true in the case of fishery products where we deal with a highly perishable commodity. The question is whether it is enough if the raw material is fresh or packed in plentiful quantity of ice to obtain a good end product or whether any extra precautions are necessary during its passage through the various stages of preprocess preparation to the final product.

Sustained work has now clearly shown that besides freshness of the raw material many factors have to be taken care of at every stage of production to obtain a good finished product. In fact, well defined process control measures, varying in details with the products under pre-

paration, are required to be practised to ensure uniformity in quality. In the small type fishing boats used for prawn fishing in India the catch will generally be spread on the boat deck or kept stacked in cane baskets. Normally the raw material should keep in good condition at the time of landing as the duration of the fishing trip is generally too short to cause any damage to the catch. If icing also is done there should not be any ground for concern about the quality of the landed raw material. However, this need not always be the case as has been shown by several experimental studies. It is observed that the boat decks and containers used for storing fish can have an appreciably high build up of bacteria including the faecal type if precautionary measures are not taken. Raw materials coming into contact with such

surfaces are invariably found to have high bacterial counts accompanied by development of specific spoilage odours. Rubbing of the surface and hosing with water have not been found to reduce the rate of incidence of bacteria. On the other hand if a strong detergent is used to remove the slime followed by contact with a disinfectant in the form of chlorine at fairly high levels of 1000 p. p. m. or over there is remarkable effect. Materials stored under such conditions rarely showed any contamination from faecal streptococci or coliforms.

In the primary processing centres too similar contamination might take place from unclean surfaces and the only way out is to maintain strict hygienic conditions. In addition the material comes into contact with water and ice more often during this stage. Ice prepared from bad water or if prepared from good water when dragged along unclean surfaces, can serve as a source of bacteria to the products which they preserve. Similarly water used for washing and other purposes if not well chlorinated can add to the bacterial load of the material instead of reducing it.

In the factories also contamination from the above sources—ice and water—can continue at different stages. It is essential to keep down the bacterial load on all surfaces and in vessels with which the material comes into contact to less than 1000/sq inch by following effective cleaning schedules using both detergents and disinfectants. In freezing factories ice and water are used more often than in canneries. In block freezing of prawn nearly 2 pounds of water go along with every 5 pounds of prawn. There is also the final reglazing process where the trays containing frozen material are dipped in water

to separate the blocks which are then packed in waxed cartons with an additional instalment of water to cover the unglazed side. The material can be contaminated at any one of these steps if minute care is not taken. For example if the glazing and reglazing water are not absolutely clean and bacteria-free or if the ice used to cool these are prepared from unclean water or dragged along slimy surfaces or if the freezing trays are not cleaned properly or if the same water is used over and over again for dipping purpose or if the vessels used for pouring water from the tubs are not free from bacteria there is possibility of contamination of the material with millions of bacteria and of the product becoming unfit for human consumption even if very fresh raw material is used. Simple control measures like frequent changing of the glazing and reglazing water, chlorination of all water used in the factory including that used for manufacture of ice, treatment of vessels and tables with detergents followed by chlorination etc., could prevent many of these ills.

In canning operations too the quality of water is of paramount importance. Presence of trace amounts of copper and iron in the water used for blanching and in the brine used for filling can cause blackening to the product. This effect will be more apparent in products like prawn where sulphur compounds are readily available. Impure water used for cooling the heat processed cans can cause more havoc than any other factor to the canned product. Even minute fractions of such impure water sucked into the cans during cooling will contain sufficient bacteria to spoil the material—by producing swells, liquefaction of the products or off odours depending on the type of organisms present in the water.

Fisheries Co-operatives Assured of Continued Assistance

The Government of India in a communication sent to the President of The Indian Seafood Exporters Association, in reply to the Memorandum submitted by the Association while conveying their desire not to interfere with the formation of the Kerala Fisheries Corporation, have assured that the Corporation will assist the Fisheries Co-operatives. In accordance with this policy the Fisheries Corporation has now started extending freezing facilities in their Cochin and Neendakara Plants to the Travancore - Cochin Prawn Curers'

Co-operative Marketing Society Ltd., Cochin, and the Quilon Regional Fishermen Co-operative Sales Organisation Ltd., Neendakara. These two Co-operative Societies, it may be recalled, were freezing and exporting from these plants, when the Corporation took them over.

It may be noted that fears regarding the future of the Societies were voiced by the Indian Seafood Exporters Association in their Memorandum submitted to the Prime Minister.

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Marine Council Election

STOP PRESS

Since going to press we are happy to announce that both the candidates of the Indian Seafood Exporters Association who were contesting the seats from the Fresh Frozen & Canned Panel, have been declared duly elected. These candidates, namely, Shri Baby John of M/s. Kerala Seafoods and Shri P. I. Gopalan Nair of M/s. Feroke Frozen Foods defeated their opponents Shri P. K. Nair of M/s. Choice Canning Co. and Shri N. J. Chacko of M/s. Kerala Food Packers sponsored by the Seafood Cannery and Freezers Association.

The Indian Seafood Exporters Association has sponsored candidates for all the four seats which have fallen vacant in the Marine Products Export Promotion Council owing to the retirement of the sitting members. Two of these four candidates put up by the Association have already been returned unopposed from the Dried Panel for the Bombay and Tuticorin

seats. Indications are that the remaining two seats from the Fresh, Frozen and Canned Panel would also be annexed by the ISEA candidates, defeating those sponsored by the Seafood Cannery & Freezers Association by a comfortable majority.

Following are the candidates sponsored by the Indian Seafood Exporters Association:-

Dried Panel:-

Shri Abdul Hamid Ahmed Kasmani of
M/s. Abdul Hamid Ahmed & Co.,
Bombay.

Returned unopposed from
the Bombay seat.

Shri S. Ambrose Fernando of
M/s. Seafood Exporters Corporation,
Tuticorin.

Returned unopposed from
the Tuticorin seat.

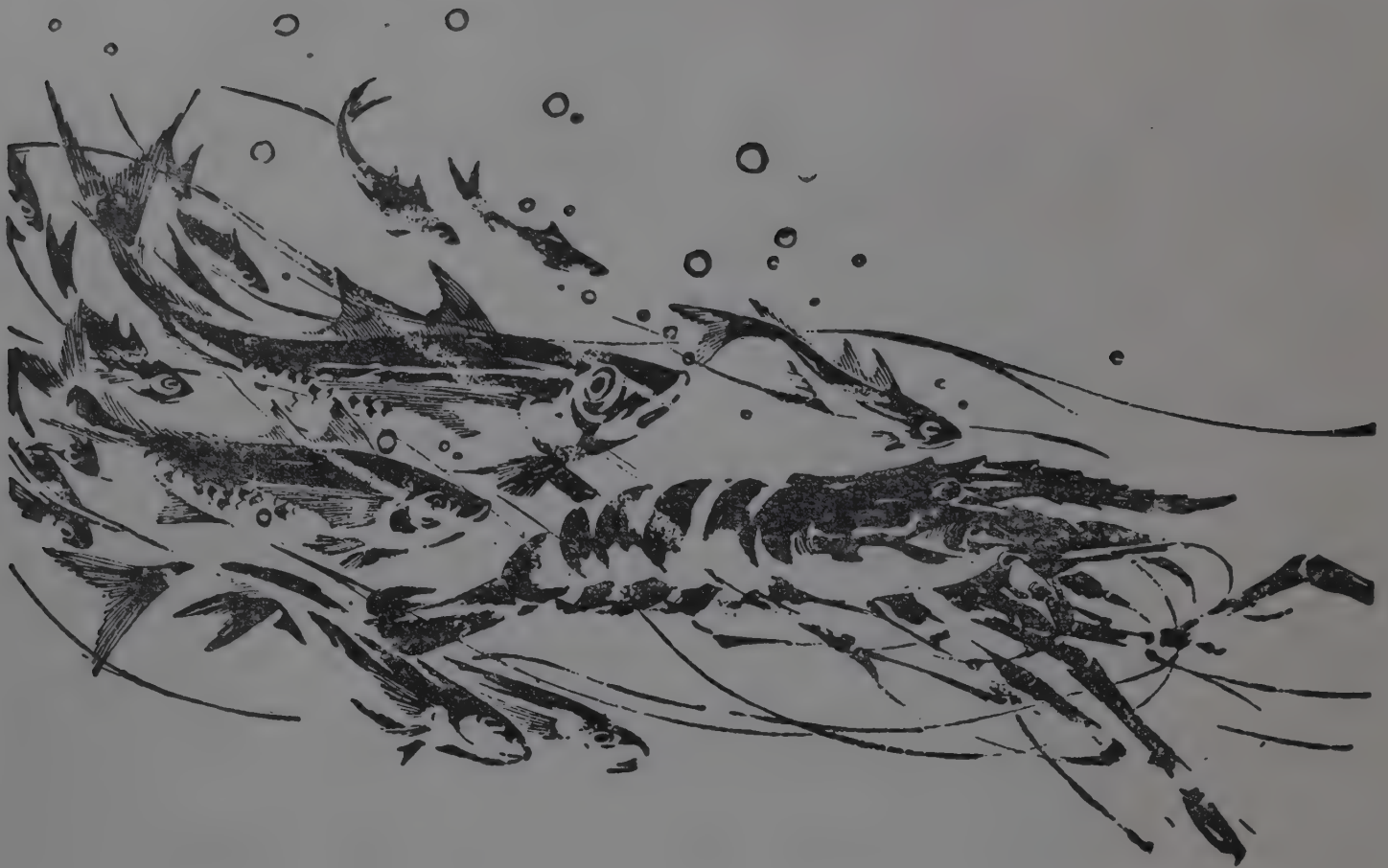
Fresh, Frozen and Canned Panel:-

Shri Baby John of
M/s. Kerala Seafoods, Neendakara,
Quilon.

Contesting the Cochin seat.

Shri P. I. Gopalan Nair of
M/s. Feroke Frozen Foods, Feroke

Contesting the Calicut seat.



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U. S. A. SHRIMP MARKET

IT was expected that production in Mexico, Panama and other Central American and Gulf of Mexico areas will be in full swing by the end of July. It has turned out, however, that the production has still not begun in these important areas. Small production, of course, goes on, but the major catches have not developed and, therefore, shortages still exist in the larger size Shrimp. According to normal patterns there should now be heavy production in the Gulf of Mexico and Panama. Until these heavy productions begin, the market will be short of Shrimp and prices will stay very firm.

The situation on very small Shrimp, however, is still weak. Green Sheet prices have declined from 73-74 Cents late in June to 65-68 Cents late in July. At the moment, buyers are reluctant to place large orders since they have watched the price of small Shrimp continue to drop and this in itself has caused further weakness. There does not seem to be any news in the foreseeable future that will reverse this trend and, thus, it must be expected that the small sizes will continue weak while the large sizes will continue strong until better production develops in the Mexican area.

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COCHIN

— “QUEEN OF THE ARABIAN SEA”

(Contributed)

THE Cochin Port, the dreamchild of the great Architect-Engineer, Sir Robert Bristow and known the world over as the “Queen of the Arabian Sea” is now passing through difficult times. As the only all-weather major harbour on the West Coast of India, next only to Bombay, it has been the port of call of many international lines. Today the table is turned and the name of Cochin has become the despair of all those who have anything to do with shipping. Many well-known steamer lines are inclined to omit Cochin and numerous exporters and importers are thinking in terms of diverting their shipments to other ports at greater expense. If the state of affairs in the port is not rectified, therefore, the results would be disastrous.

Nowadays bunches of steamers wait at the outer sea awaiting berths. Instances are not few where steamers have had to wait in this manner for even 15 days at a stretch. Consequently the ships are unable to keep up their schedule and shippers are prevented from meeting their export commitments. Many reasons are advanced for this sorry state of things. The Port Authorities are not able to allot the required berths due to lack of sufficient drafts arising from lack of or delay in dredging the channels, streams and quays, besides delay in loading and unloading of ships already berthed. Consequently large-sized ships cannot be brought in or sent out in a systematic way.

Then there is trouble from the labour in the Port. Cochin has earned, unfortunately enough, a notoriety for frequent labour uprisings — all in the name of enlightened trade unionism. The attitude of labour took a new turn recently when it began demanding “ghost money.” Thus the gangs allotted by the Dock Labour Board, an official body, dictate their own terms to shippers by demanding extra money for every item they have to handle. Very often the demand for “Ghost money” reaches unbelievably huge sums. As far as it is known this is a unique feature in Cochin and it is not clear how or why this is tolerated. The labour is paid their due wages and other

emoluments and of late there had been instances in which the gang workers refused to handle goods, sat idle or even walked away. Thus even when shippers try to effect belated shipments the labour stands in the way. Such being the case, how can the country earn the much - needed Foreign exchange, it is generally asked.

Shippers of seafoods especially have been hard hit because the workers know that these goods have to be expeditiously shipped; therefore their demand on shippers of such goods are all the greater. Drastic action against these erring workers must be taken if the situation has to be corrected.

The Port Administration must be geared up in such a way that the interests of the trade are fully protected. It is surprising that several representations said to have been made to the Cochin Port Trust, the Ministry of Transport, New Delhi, etc. by various organisations here have not so far resulted in any improvement in the situation. Consequently diversion of cargoes to other ports like Tuticorin and Madras are becoming a commonplace occurrence. The Government of Kerala has also a responsibility to see that such an important port like Cochin continues to play its vital role in the economy of the State. If the present drift is allowed to continue the day may not be far off when the "Queen of the Arabian Sea" becomes a "Curio of the Arabian Sea."

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NEWS & NOTES

Marine Council Reverses Decision on Ice & Cold Storage Plant.

The Committee of Administration of the Marine Products Export Promotion Council which met here on 4-7-66 decided that the matter regarding the Ice & Cold Storage Plants proposed to be put up by the Council should be left in the hands of the Kerala Government in view of the assurance of the Kerala Director of Fisheries to complete the plants on the Kerala Government account expeditiously.

"Exports Exhibits of India" Exhibition

An Exhibition entitled "EXPORTS EXHIBITS OF INDIA" organised under the auspices of the Ministry of Commerce, Government of India, was inaugurated recently at Madras. Various Export Promotion Councils including the Marine Products Export Promotion Council are participating in the Exhibition which among other things is exhibiting Marine Products also.

Freezing operations by Fisheries Co-operatives.

The Travancore - Cochin Prawn Curers' Co-operative Marketing Society Ltd., Cochin and the Quilon Regional Fishermen Co-operative Sales Organisation Ltd., Neendakara, have resumed their freezing operations at the Government Freezing Plants of Cochin and Neendakara respectively.

Can Making Machinery for Poysha arrives.

M/s. Poysha Industrial Company, Bombay who are putting up their can-making plant near Ernakulam are receiving their machinery from West Germany and other Western Countries by s. s. "Indian Resource" and s. s. "Jal Jawahar" due to arrive Cochin shortly. The machinery arriving for this firm is said to be the latest and most modern type in the can-making industry in India. Having crossed their first hurdle by securing the necessary lands through the Government of Kerala, this firm should be able to start production in the near future.

N. C. Koli to Visit U. K.

Shri N. C. Koli, Managing Director of the Maharashtra Rajya Machimar Sahakari Sangh Ltd., Bombay is proceeding to U. K. & Continent during the 3rd week of August to study the market conditions for Fish and Fish Products etc., in these countries.

Nylon Fishing Net Factory

The Government of India, it is understood, have decided to start a Nylon Fishing Net Factory in the Public Sector the machinery for which will be supplied by Japan.

More Fishing Harbours for Kerala

The Government of India, according to reports, have decided to develop three more Fishing Harbours in Kerala during the Fourth Plan Period. These will be in addition to the five Fishing Harbour projects taken up during the Third Plan.

Indian Fish catches decline.

Fish catches in India have recorded a decline during 1965/66 and, according to a Government announcement, the catches were short by 1.4 lakhs tonnes compared to the previous year. This was mainly due to the shortage in Sardine catches, it is stated.

Obituary.

Rao Sahi C. J. Mathew, a Government nominated member of the Marine Products Export Promotion Council passed away recently due to an heart attack. He was also the President of the Mechanised Fishing Vessel Owners Association. He was 65.

Shri Madhavaraj to visit U.K. & U.S.A.

Shri M. Madhavaraj, Coronet Canning Co., Malpe (Mysore State) is leaving Bombay by air on the 15th August on a business tour to U. K. & U. S. A.

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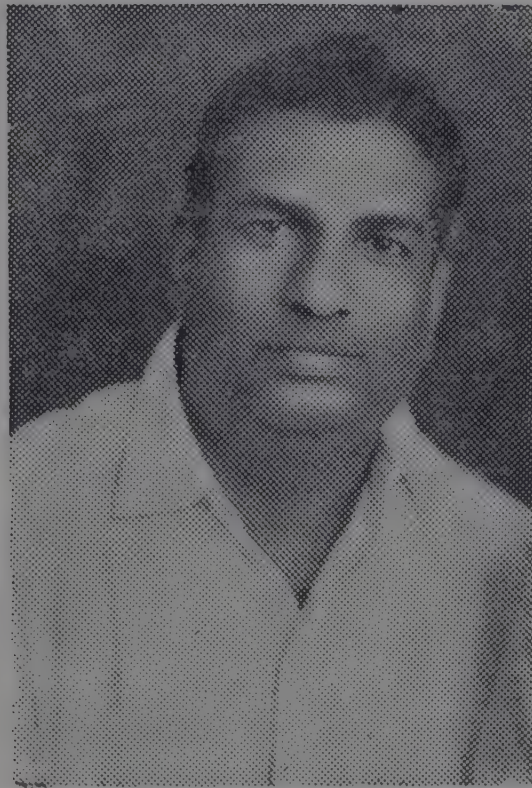
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OBITUARY



With profound regret we record the premature death (on July 29, 1966) of late Mr. P. K. Gopalan, a Founder Member of the Indian Seafood Exporters Association, in a car accident near Poothotta. He was 44 years of age. He is survived by his wife, two sons and three daughters, besides his parents.

The late Mr. Gopalan was Proprietor of Radha Bus Service, Beena Bus Service and XL Seafoods. An enterprising businessman, he rose to great heights from a small beginning and earned an enviable reputation as an industrialist.

It is indeed unfortunate that Fate should have snatched him away especially at a time when he had chalked out a programme for a large-scale expansion especially of the XL Seafoods.

Quiet, unassuming and hardworking, the Indian Seafood Exporters Association, Cochin, owes to him a deep debt of gratitude for his valuable help, guidance and support especially during its infancy.

We wish to convey to the bereaved family our heartfelt condolences.

May his soul rest in peace!

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VOL. 1 - No. 4

AUGUST 1966

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COCHIN-2

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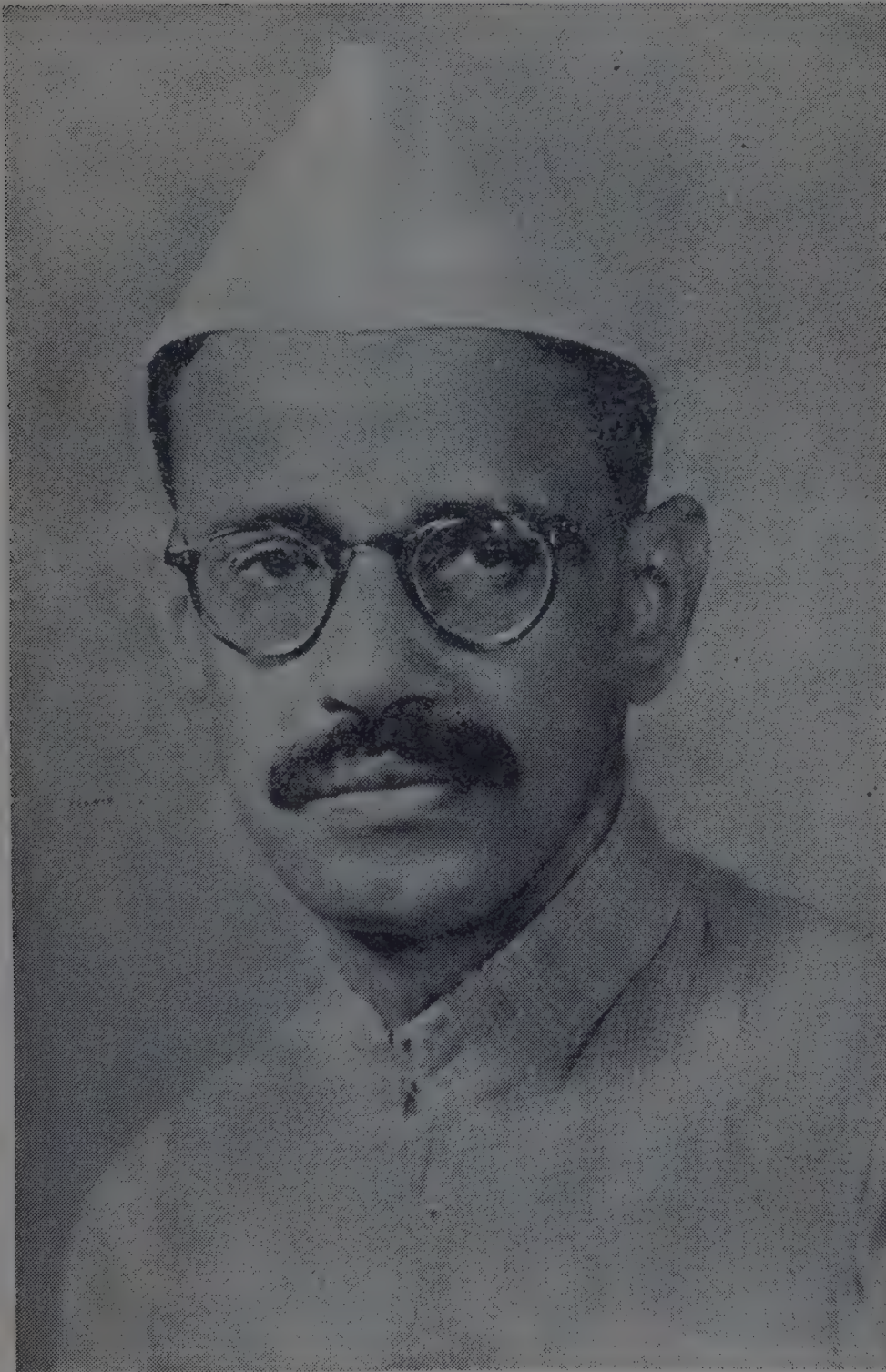
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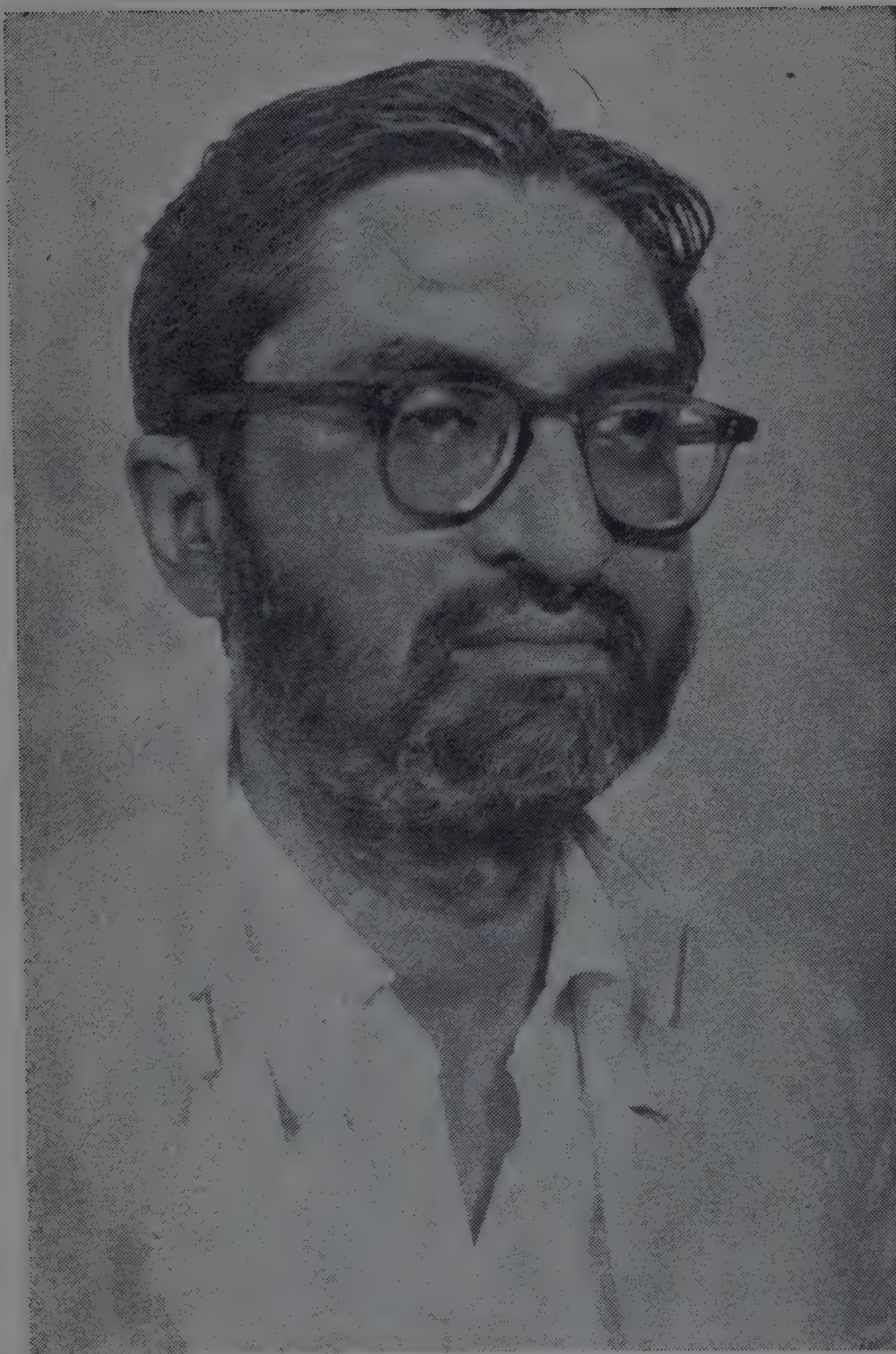
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Indian Seafood Exporters Association,
XII/322 Second Floor,
Jew Town Road, Cochin-2, India.

Attention: Mr. Kurwath Damodaran,
President.

Dear Mr. Damodaran,

We would like to thank you for sending us
a copy of the first issue of your Journal 'Seafood
Exporter'. We have read it from cover to cover and
found it very interesting.

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and wish you the greatest success in the future.

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K. P. S. Menon
Editor.



SEAFOOD EXPORTER

VOL. 1

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AUGUST, 1966

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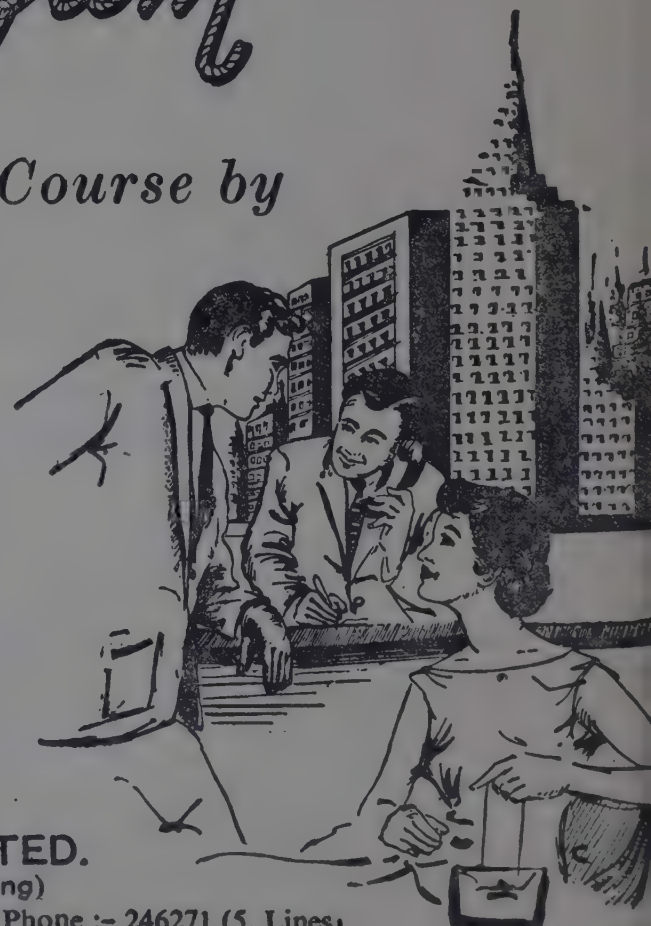
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WITH the annexation of all the four seats (two of them uncontested and two duly contested) which had fallen vacant in the Marine Products Export Promotion Council, the Indian Seafood Exporters Association has again proved that it enjoys the support of a large majority of Seafood Exporters. The event also goes to show that the Seafood Industry clearly acknowledges the services rendered by the Association in the past. At the same time we are conscious that it places on the Association a heavy responsibility for the future. While thanking all the voters for the support they unflinchingly extended to it, the Association wishes to take this opportunity of assuring them that it would continue to endeavour its utmost to discharge its duties and responsibilities to the best of its ability.

Needless to say, the Association consistent with its stand had brought up the Kerala Fisheries Corporation and its avowed functions as one of the important election issues. If, therefore, the results are any guidance the verdict clearly goes against the Corporation and all it stands for, vis-a-vis the private sector and its future with particular reference to exports. It must be remembered that both the defeated candidates, namely, Shri N. J. Chacko and Shri P. K. Nair are closely associated with the working of the Corporation. Shri N. J. Chacko is a nominated Director of the Corporation, while Shri P. K. Nayar is a co-Director of Shri R. Madhavan Nayar (Messrs. Cochin Company) who is also a Director of the Corporation. Thus these two "representatives of the trade" have become *persona non grata* insofar as their representative character is concerned. The Seafood Industry has proved this beyond doubt through the election results.

Earlier by nominating these two gentlemen to the Corporation the Government of Kerala had failed to consider the views on the subject of the Indian Seafood Exporters Association. The Association had expressed its apprehensions that the Corporation was formed only

to favour a few individuals. The nomination of these two Directors had only helped to increase the fears. Even assuming for a moment that this Association's representatives could not be favoured for purposes of nomination, in view of its opposition to the commercial activities of the Corporation, there was hardly any justification behind the nomination of these two persons as "representatives of the trade". There were indeed other prominent representatives of the industry who would have proved themselves acceptable to all sections of the industry and the public. In this connection the name of Shri Saley Mohamed Ibrahim Sait, who, besides being a senior Partner of one of the largest seafood exporting concerns in Asia, is also a Member of Parliament, suggests itself.

The Government of Kerala, however, regrettably failed to assess the feeling of a very large section of the industry. We are glad therefore, that the recent elections to the Marine Products Export Promotion Council provided a much-looked-for opportunity to the industry to express its views on the matter in the clearest possible terms. The Council is a body sponsored by the Government of India. All the exporters of fish and fish products are represented there. Therefore, the feelings of the representatives of industry as expressed through the election, should, in our view, be given due weight and consideration.

While commending the election results to the immediate attention of the Government we wish to indicate that the time has arrived for it to reconsider its stand with regard to the Kerala Fisheries Corporation. The consensus of opinion has recorded an adverse verdict on the Corporation and its activities. It has also questioned the representative character of the two nominated Directors. It is now for the Government to rectify the error.

Improved Methods for the Production of Salted and Dried Fish

Paper Presented at the
Seminar on Agricultural Production
Held at Bangalore

By

Dr. S. V. Suryanarayana Rao & Dr. D. P. Sen
Scientists, C. F. T. R. I., Mysore

FISH constitute an important contribution to food supply particularly as a source of animal protein and efficient utilisation of fish as food is possible only by making use of scientific methods of preservation. Marine fish make up 2/3 of the total production and fish catches are highly seasonal and localised gluts are of common occurrence. More than half of the quantity of marine fish landed in India is preserved by curing based on salting and sundrying. But the methods employed are quite primitive and the products are not only of poor quality but also limited storage life. They do not keep for more than two or three months. Moreover there has been a further set-back in the industry due to the decline in export trade. Dried fish formed a well known export commodity to the neighbouring countries like Burma and Ceylon and used to fetch upto 5 crores of Rupees. While frozen and canned fish and shell fish are yielding

valuable foreign exchange, exports of salted and dried fish have dwindled in recent years.

While advanced scientific techniques like freezing, canning and cold storage are useful for successful preservation of fish in selected areas, it will not be possible to apply them for all the fish that is landed nor will it be possible to keep the cost of processing within the reach of the common man. There is therefore a need for more economic methods of preservation like curing which offers a cheap and nutritious food product to the poorer sections of the community. There is much to recommend in the choice of curing as a method for efficient utilisation of fish. For one thing very little capital equipment is required and moreover methods of salting and sundrying are simple enough for small scale application all along the Coast at fish landing centres. As a matter of fact there is nothing

basically wrong with the traditional methods of curing and they are easily capable of improvement. Incidentally it may be mentioned that in the continent a substantial quantity of herring catch is salt-cured and used as such. One will be surprised to see the way these are packaged and advertised.

The first thing that needs improvement in the fish curing industry is better sanitation. The way in which fish are cured and marketed in India is extremely unhygienic. Although the State Govts. have provided fish curing yards for use by the fishermen, many of them are in a dilapidated condition and there is need for erection of modern curing sheds, a few of which may suffice to serve as models for the industry. Systematic application of modern detergents, antiseptics and insecticides is highly essential to check contamination by bacteria, molds and insects.

Adequate quantity of salt is highly necessary for the salting of fish. It has been found that salt employed by fishermen in India is quite inadequate. Salt ratio employed must be such that the tissue fluid in the product is saturated with salt and the ratio of salt to dressed weight of fish works out as 1:4.5 for pure sodium chloride. With an inferior grade of salt, ratio should be proportionately higher.

Quality of salt to be used for fish curing is also quite important, Indian Standard Institute has laid down certain standards for common salt to be used for fish-curing but it is difficult to get salt of such standard quality. Quality of salt used by curers is very poor. Many of these samples contain a large amount of matter insoluble in water and a fair amount of moisture and consequently poor in sodium chloride

content. Insoluble matter present in salt leaves unattractive crust on the fish.

Extent of drying is also very important for proper storage of such products. Salted sundried mackerely should be dried to about 30% H₂O level in order to have a long storage life. But such a low moisture content is not generally liked by the consumer. In such a case where products with higher moisture content (say 40-45%) are to be preserved, chemical preservation (described subsequently) has to be used.

During the stage of sundrying it is necessary to avoid contamination with sand. This is achieved by drying on elevated platforms. Insect infestation can also occur at this stage and hygienic conditions have to be maintained. One of the ways of improving the quality of cured fish is to regulate the extent of salting and drying as to conform to a few minimum standards of quality. Standards for moisture, salt and insoluble ash content can provide an adequate safeguard of quality apart from the general appearance and absence of external signs of spoilage.

Chief among the factors limiting the quality and storage life of cured fish can be listed as follows (i) growth of molds (ii) Reddish discoloration due to a special type of bacteria (iii) Insect attack (iv) Development of putrid smell (v) Rancid odour and (vi) Brownish discoloration.

It has been found by Research efforts in recent years that it is possible to prevent most of these defects (namely i to iv) by incorporating small quantities of preservative chemicals and to minimise the brown discoloration by incorporating suitable antioxidant such as ascorbic

acid or Butylated hydroxy anisole (BHA). Sorbic Acid, propionic acid and benzoic acid have been found to be effective against bacteria and molds growing in salted and dried fish. Such chemicals are quite harmless to health and their use is permitted in many advanced countries. Propionic acid and its salts are widely used in breadmaking and its use for fish preservation is permitted in Denmark. In case of Sorbic Acid is extensively employed in recent years in many types of food products. Use of sorbic acid and benzoic acid is legalised for fish products in many countries such as Austria, Denmark, West Germany, Sweden, Switzerland, U. S. A., and Canada. Research work so far carried out at C. F. T. R. I. indicates that potassium sorbate in combination with sodium acid phosphate and sodium benzonate is useful in keeping salted and dried fish in a good condition (against microbiological spoilage and attack) for more than 6 months. While microbial spoilage is taken care of by above chemical treatment, insect infestation is controlled by fumigation and improved methods of packing. Although suitable methods of fumigation of fish and fish products have still to be worked out, improvement in packaging can be effected even now. Instead of gunny bags or wicker baskets which are used at present, polythene lined gunny bags will greatly improve the storage life of cured fish. It is also possible to increase the storage life of salted and dried fish by storage at lower temperatures. It has been reported from Malaya that cold storage of cured fish has been a commercial success.

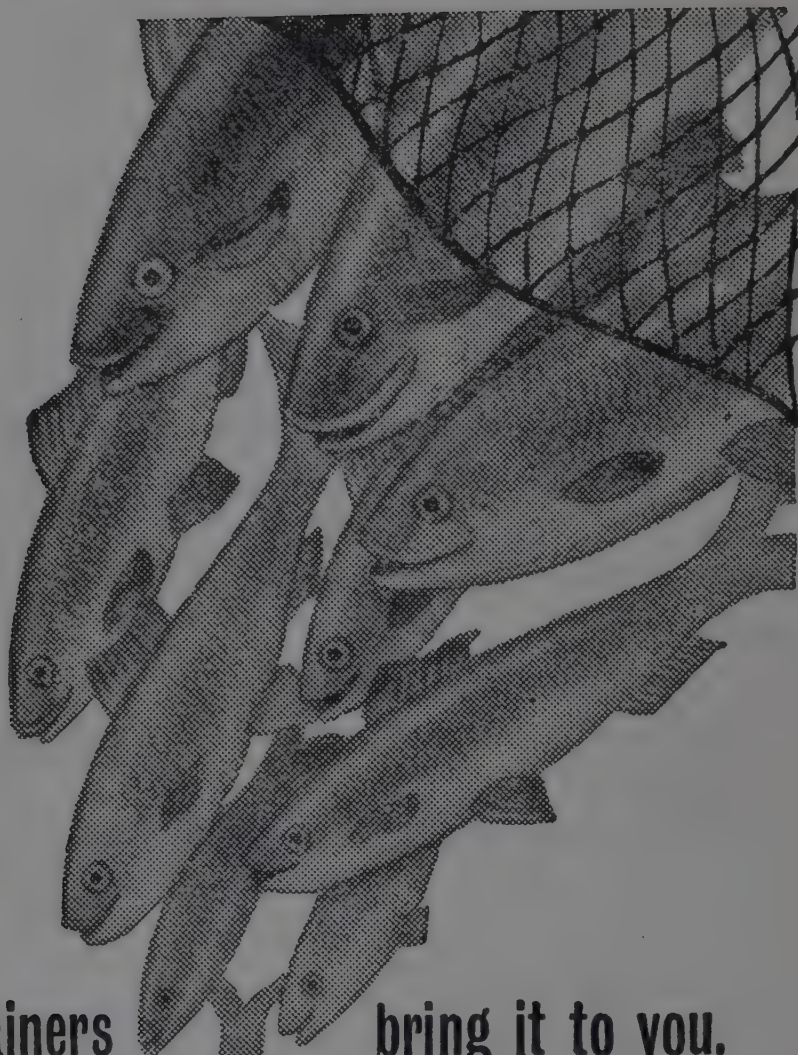
The easiest way in which improved method of curing mentioned above using chemical preservatives is commercially to be applied is to

incorporate the chemicals in the salt used for curing so that fishermen can employ the fortified salt instead of the usual one. As it is, the State Govt. is distributing salt to the fishermen in the Fish Curing Yards. They need only to arrange for the mixing of the required quantities of the preservatives in the salt before distribution. The State can also set up a single centre for the fortification of salt used for fish curing. The C. F. T. R. I. has worked out the composition of the special salt to be used for Fish Curing. Potassium Sorbate, Sodium Benzonate and Sodium dihydrogen phosphate are incorporated in the salt at 0.5%, 0.25%, and 1.5% level on the weight of common salt and a ratio of 1:4 for salt to dressed weight of fish being recommended for curing. For mackerel, this works out as 250 Kg. common salt containing 1.25 Kg. of potassium sorbate, 0.625 Kg. of Sodium benzonate and 3.75 Kg. of Sodium acid phosphate for 1130 Kg. of whole fish or 1 m. ton of dressed fish or 550 Kg. of dried fish.

To minimise the rate of browning, it is useful to incorporate BHA (0.5 Kg./250 Kg. common salt or for 1 m. ton of dressed wt. of fish) and citric acid (0.1 Kg.).

Before the industry can take up the new process namely the curing of fish with salt containing chemical preservatives, the Govt. has to undertake legislation to permit the use of the above chemicals in fish processing up to a specified level. There need be no hesitation in according such legislative permission immediately since the chemicals in question have already been approved for such use in other advanced countries. When such a product is to be exported, food laws of the importing countries are to be taken into consideration.

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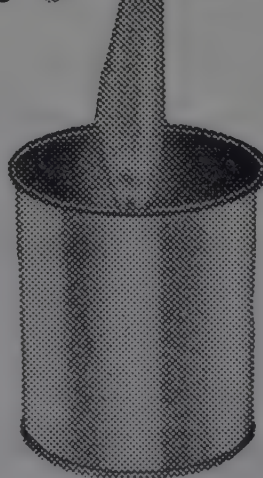
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SOVIET SCIENTISTS INTEREST IN INDIAN FAUNA

Indian Ichthyologist Greatly Impressed

A. LYUBARSKY

Dr. A. G. K. Menon from Calcutta recently visited Soviet Union, where he saw some laboratories and institutes connected with Ichthyology.

IT took Russian scientists almost 135 years to gather the collection occupying a huge building on the banks of the Neva in Leningrad. When you look at the collection, you feel you are visiting the Siberian taiga, the distant antarctics, the African continent, Australia, mountains and deserts of the Asian countries and the pampas of Latin America.

The collection in question is a part of the exposition of the Zoological Museum, which is a research and scientific educational establishment attached to the Zoological Institute, USSR Academy of Sciences. There are 100,000 exhibits displayed in the spacious halls, and some of these deal with the fauna of India.

"I was amazed to see here such a rich collection of everything that we have in our lakes and rivers", said Dr. A. G. K. Menon from Calcutta. "This is certainly a testimony of the great interest which Russian scientists have long been showing in India's fauna."

Dr. Menon from the Zoological Survey of India studies the fresh-water fish of his country, their origin, evolution and distribution. Before visiting the Soviet Union, he got familiar with

the works of Russia's most outstanding ichthyologists.

"I know what the museums of many countries have, and therefore I can say with full confidence that the Soviet collection of fish is the richest", said Dr. Menon. "The fact is that it has about 5,000 varieties. Besides, it is very easy to find in all this wealth the thing that interests you. The catalogues, compiled in the museum, are very simple and convenient. On returning home to Calcutta, I shall certainly use the principle of cataloguing worked out by my colleagues in Leningrad."

On arrival in Leningrad, he expressed his desire to meet Professor Nikolai Gerbilsky, a specialist in fish farming and breeding of sturgeon and salmon varieties of fish. Gerbilsky heads the chair of ichthyology and hydrobiology of the Leningrad State University and is the chief of the Central Laboratory for the Reproduction of Fish Resources. Dr. Menon visited, at Professor Gerbilsky's invitation, the laboratory of Ichthyology and Hydrobiology Institute of the Leningrad University, where he saw some sturgeon fry which were bred near

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ingrad out of the spawn brought from
kal, situated thousands of kilometres away.
r several years already, this fry has been let
into the Gulf of Finland. If the fry
s acclimatised, Soviet ichthyologists will
ve an important problem connected with the
ther development of fish farming in their
untry."

Dr. Menon also had a meeting with
Professor Oleg Bauer, Deputy Director of the

the laboratory of fish genetics," said Dr. Menon.
"A new variety of carp has been obtained, and
it has the best qualities of the two prototype
varieties: it has the cold resistance of the Amur
carp and the fast rate of growth of the European
carp. This interesting method should be used
in India, too. The fact is that the fish of the
alpine lakes of the Himalayas are cold resistant,
but do not have the requisite rate of growth.
Why shouldn't we select a suitable variety to



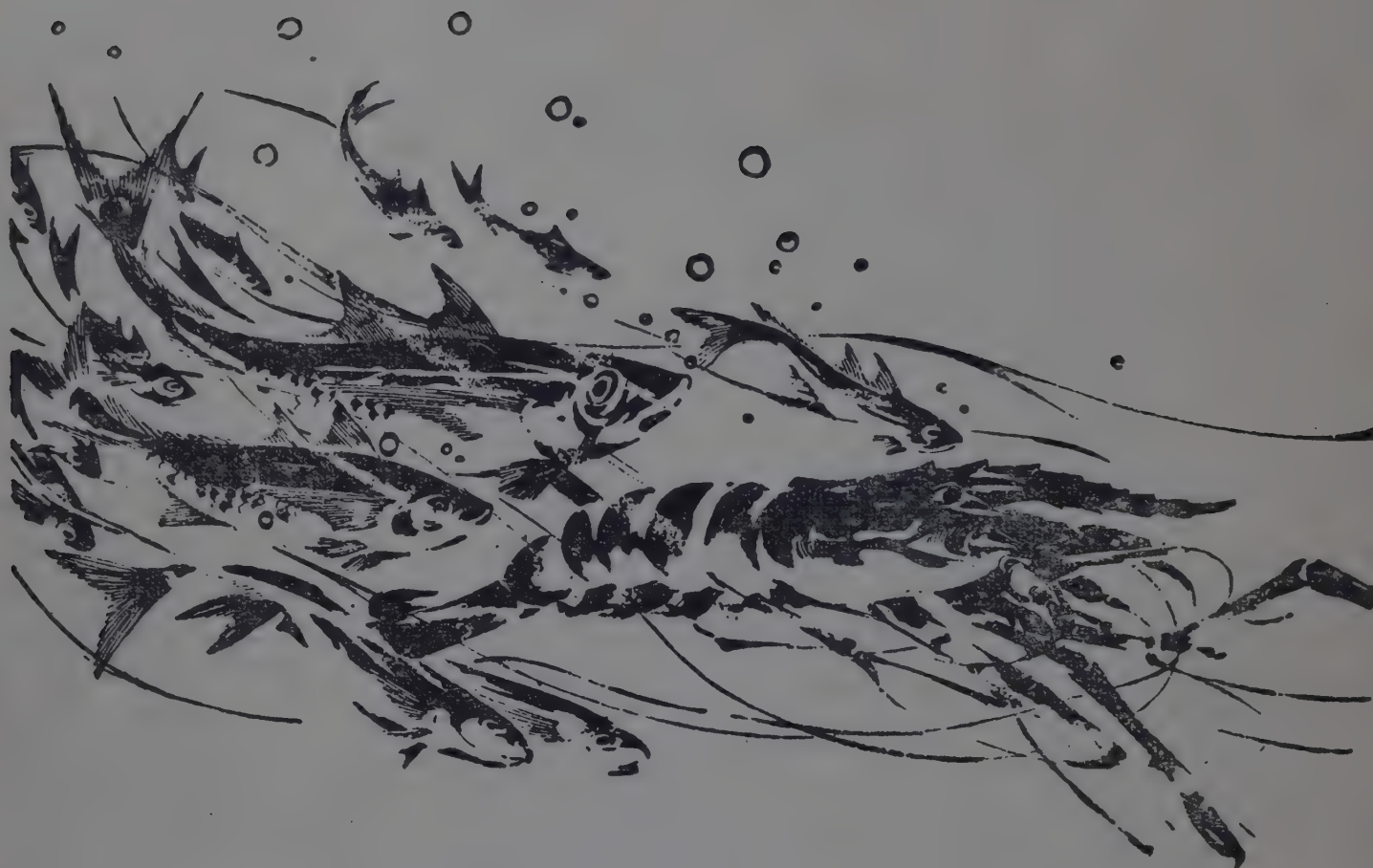
tate Research Institute of Lake and River
fisheries. Bauer took the Indian scientist to an
experimental base, several score kilometres
away from the city and familiarised him with
the work of hybridisation of the carp variety,
inhabiting the waters of the Amur with the
European carp.

"I was shown this hybrid produced under
the guidance of Valentin Kirpichnikov, chief of

cross-breed it with the Himalayan? I am sure
that we will get positive results."

Dr. Menon spoke of the usefulness of the
extension of contacts between the ichthyologists
of India and the Soviet Union, and about the
importance of such contacts for the develop-
ment of science and fisheries of the two friendly
countries."

(Novosty Press Agency (APN)



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1974/5 237A

THE KERALA FISHERIES CORPORATION

E. B. M. MENON

Malabar Pack Marines, Calicut

I had recently an occasion to talk to one of the nominated Directors of the Kerala State Fisheries Corporation. We were one of the Exporters affected by the formation of the Corporation inasmuch as our Exports from the Government's Calicut Plant were stopped without notice to enable the Department of Fisheries to start exports as a prelude to the formation of the Corporation. This gentleman told me that the Government of Kerala would have considered giving us extension of time to continue our exports but for the fact that we were all considered "Poor People" with no strength behind our representation. This statement, coming as it did from one of the Directors was surprising. It meant that in this country only the rich have a place in the present set up. Simultaneously we see and hear repeated statements of our Government's desire to form a Socialistic pattern of Society with equality of opportunity for the citizen. The Government also profess to support and help small scale industries!

As far as can be judged, the Department of Kerala and now the Kerala State Fisheries Corporation, hold different views and they do not believe in helping small exporters. Apparently, they would like to help the rich to become richer and the poor to become poorer.

We, in Calicut, had four exporters operating from the Government Ice & Cold Storage Plant and compared to the facilities made available

by the Department of Fisheries, we have done extremely well viewed from the country's export point of view. We have also done our best, or should we say, the worst to increase the revenue of the Department of Fisheries by paying exorbitant rentals every year. Actually it seems to me that such rentals received by the Department encouraged them to go for commercial operations on their own.

In every act of the Government, it was to be repeated that they would judge the effect of their schemes on the people, the industry and the country as a whole. In the formation of Kerala State Fisheries Corporation, however, no such effort was evidently made. In the first place, they eliminated the four Exporters who were depending on their export trade for a living from their Plants. Our constitution does not permit anyone – even the Government – to take away his means of livelihood, but this is exactly what the Kerala Fisheries Corporation did. Normally a compensation at least should have been paid for such undignified act, but in our case, not only nothing of the kind happened but the Department of Fisheries failed to fulfill their commitment to allow us an extension of 3 months, for exports.

Immediately after the Department of Fisheries took over the Plant, there was feverish activity on the part of authorities to purchase, process and pack for export. However, this enthusiasm slowly but naturally gave way to

despair as Prawns were not easily available, firstly due to competition from Private Sector and secondly because many of the items required for export were not purchased. To overcome this difficulty, the Private Exporters in Calicut were requested to help them. Some of them did help the Government with their equipments as otherwise the Department would not have been able to pack the Frozen Marine Products. The unnecessary haste shown for exporting departmental packs was wholly out of place and unwarranted.

In their anxiety to export, the Department of Fisheries forgot to make any import arrangements in the U. S. A. They had to suddenly conclude an arrangement with Mr. Rouben representing Atlanta Trading Company in U.S.A. This showed the unnecessary haste and lack of planning on the part of the Departmental Officials. This was but a short cut to enable Mr. Rouben to be covered with a percentage from the exports made by the Corporation. Here is a case for an enquiry by the Public Accounts

Committee or a Special Committee to find out why all this haste was shown and what the implication of such arrangements are.

It is often said that the Corporation will ship quality goods and increase exports. It must be remembered that pre-shipment quality control is exercised by the Central Fisheries Institute and every exporter will have to confirm to the standard specifications. The Corporation also will have to go by these standards and get their exports certified by the same Authorities. It is not known how the question of quality arises at all. Regarding increasing exports, the Corporation's performance remains yet to be judged.

The only benefit from the Corporation seems to be the advantages the Officials of the Department of Fisheries have. They have enough resources at their command, opportunity to travel abroad and draw increased travelling allowances etc. These advantages for Government officials particularly in the Fishery Department are apparently very attractive.

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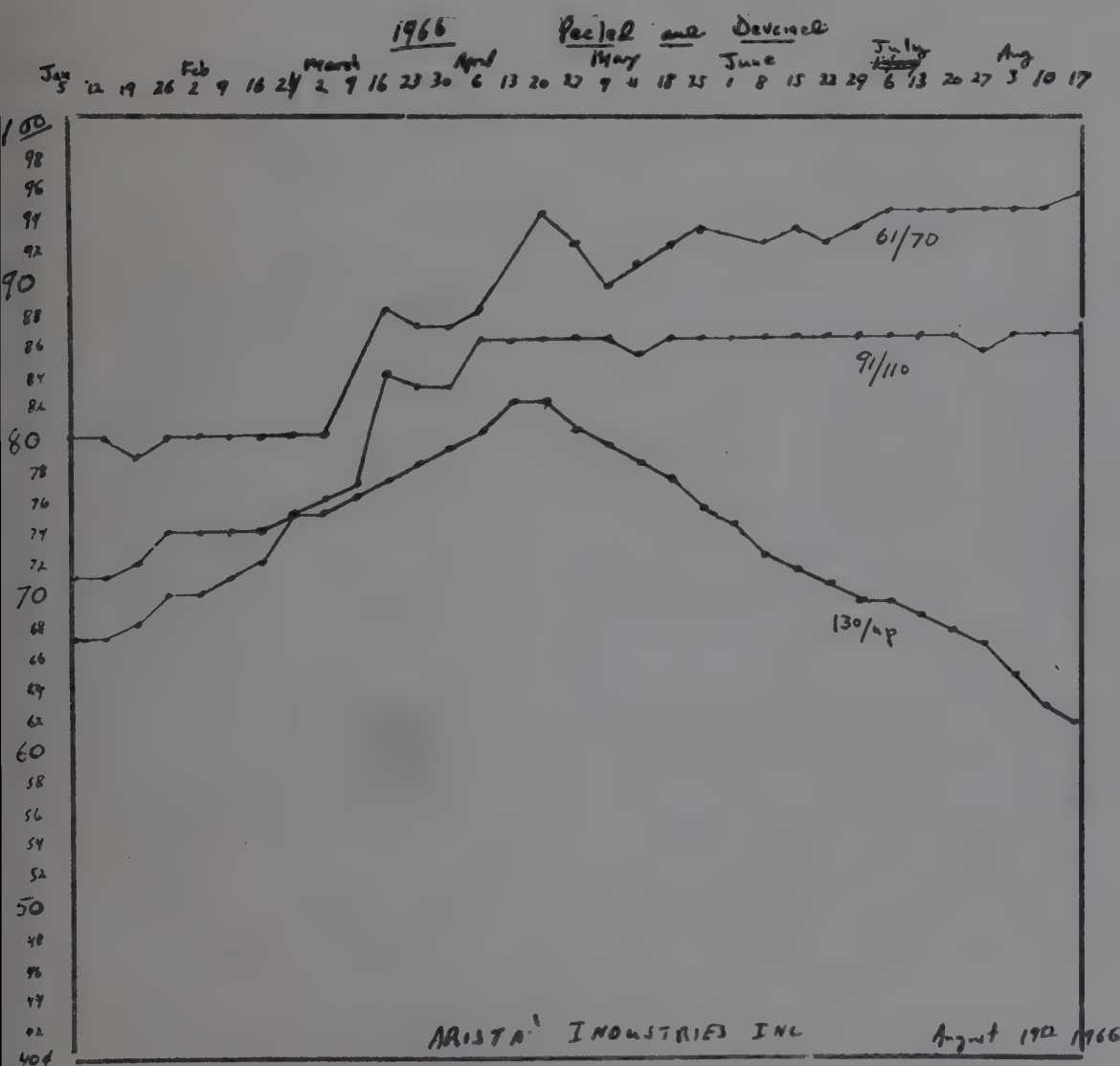
Market Analysis for January-August 1966

THE year started with a fairly average price for each size and a fairly normal spread between the prices of the three sizes - 61/70, 91/110 and 130/up. As the year progressed several unusual things happened. First of all, the 130/up had a steady rise in price from January until April 13 without interruption. For one week the price levelled off and since April 20 the price has been declining without interruption. This remarkably steady increase in the first part of the year and decline for the second part is most unusual. On April 24 the increase in price for 130/up was faster than that for 91/110.

At that one point both sizes were selling for the same price.

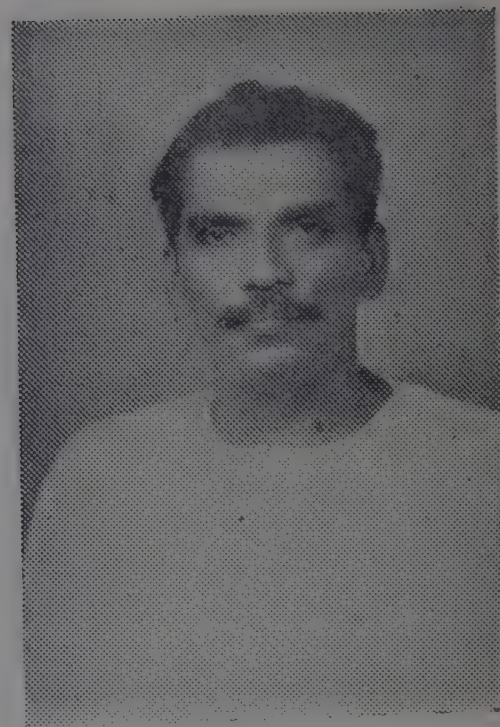
January, February, March and April showed the three sizes moving approximately together. From May 11 on, however the 61/70 and 91/110 have moved together, the 130/up have been in an entirely separate pattern. While the first two sizes remained steady the 130/up have declined steadily. At the beginning of the decline there was a 4 cents a lb. spread between the 91/110 and the 130/up. Late in August the spread has increased to 25 cents a lb. which is an historic high. Never before

has the spread between the 2 sizes been so great. This obviously means that quite soon there should be very drastic change in price for either the 130/up or the 91/110. The present difference in price cannot continue for ever and surely either the 130/up will improve or the 91/110 will decline in price. Another interesting feature of the market is the steady price for the 61/70 and 91/110 from May 25 to the present time. There has been practically no change in price. The graphic figure given below helps to study the market analysis.

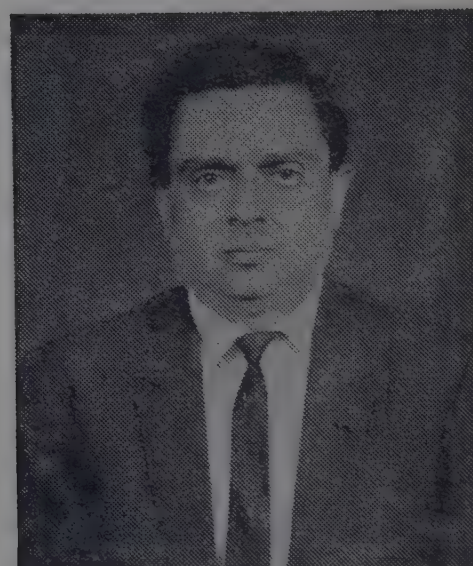


Successful
ISEA
Candidates

Shri BABY JOHN
Kerala Seafoods, Neendakara.
Elected to the Cochin Seat from
the Fresh, Frozen and Canned Panel.



Shri S. AMBROSE FERNANDO
Seafood Exports Corporation,
Tuticorin & President, Fish
Exporters Chamber, Tuticorin.
Elected to the Tuticorin Seat from
the Dried Panel.



Shri EBRAHIM ABDUL HAMID
KASMANI,
M/s. Abdul Hamid Ahmed & Co.,
Bombay.
Elected to the Bombay Seat from
the Dried Panel.

ISEA Candidates' Sweeping Victory Over the Monopolistic Group

WITH the announcement of the results of the election for the two contested seats, all the four seats that had fallen vacant have been annexed by the ISEA candidates (as briefly reported in our last issue). The two seats which were annexed uncontested were the Dried Panel seats from Bombay and Tuticorin. The two contested seats were the Fresh, Frozen and Canned Panel seats from Cochin and Calicut. The ISEA candidates, Shri Baby John of M/s. Kerala Seafoods, Quilon and Shri P. I. Popalan Nayar of Feroke Frozen Foods, Calicut, contested the election for the Cochin and Calicut seats. They were opposed by Shri P. K. Nayar of Choice Canning Co., Cochin, for the Cochin seat and Shri N. J. Chacko of M/s. Kerala Food Packers, Alleppey, for the Calicut seat. The elections which were keenly contested, resulted in the success of the ISEA candidates. Their opponents Sarvashri Chacko and Nayar were supported by the powerful monopolistic Group. The opposition, as a last-minute election stunt, even unleashed a volley of mischievous propaganda attacking the President of ISEA personally and in bad taste. In spite of the mighty forces arrayed behind and notwithstanding the scurrilous propaganda carried on by the opposition in a desperate bid to mislead the voters, members of the industry did not lose their balance but gave a befitting verdict against monopolist groups and vested interests. Thereby they also hoo-hoohed the ill-conceived and misdirected propaganda and helped the ISEA candidates to come out with flying colours.

The election results besides confirming the representative character of the Indian Seafood Exporters Association, also gave a clear verdict against the Kerala Fisheries Corporation, whose commercial activities were opposed by the ISEA, tooth and nail. It may be remembered here that the ISEA had raised the Fisheries Corporation as an issue for the Election. The election result is more significant as the candidates defeated were strong supporters of the Fisheries Corporation. Out of the 2 defeated candidates, Shri N. J. Chacko, is a nominated Director of the Kerala Fisheries Corporation while the other defeated candidate is a co-Director of Shri R. Madhavan Nayar of M/s. Cochin Company, who is another nominated Director of the Corporation.

The election has also brought to light another important point for consideration of the Export Promotion Council. In the present election the Council created a new precedent by allowing Shri N. J. Chacko to contest the Calicut region seat which normally should have been left to the Calicut members. The Calicut members took Shri Chacko's candidature as a challenge and gave the reply he deserved by rejecting his claim to get even a single vote. The only vote that Shri Chacko got from Calicut, from where he contested, was the vote of a Kerala Government concern functioning at Calicut! At least from now on we hope that the Council will set up healthy conventions to prevent performances of this nature in future.

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Chairman of the Marine Council

Shri M. P. Alexander, Chairman of the Marine Products Export Promotion Council has been transferred as Chairman for the Cardamom Board and Spices Export Promotion Council. Shri Alexander was Chairman of the Marine Council for the past four years during which period the industry achieved remarkable progress. It would not be an exaggeration to say that the industry's present position is attributable largely to his untiring efforts. The Indian

Seafood Exporters Association wish him well in his new assignment.

We take this opportunity to welcome Shri V. M. Srikumaran Nair as the Council's new Chairman. With a vast and rich experience to his credit we are confident he will address himself to the task of solving the problems facing the industry and ensuring steady progress. We wish him well in his endeavours.

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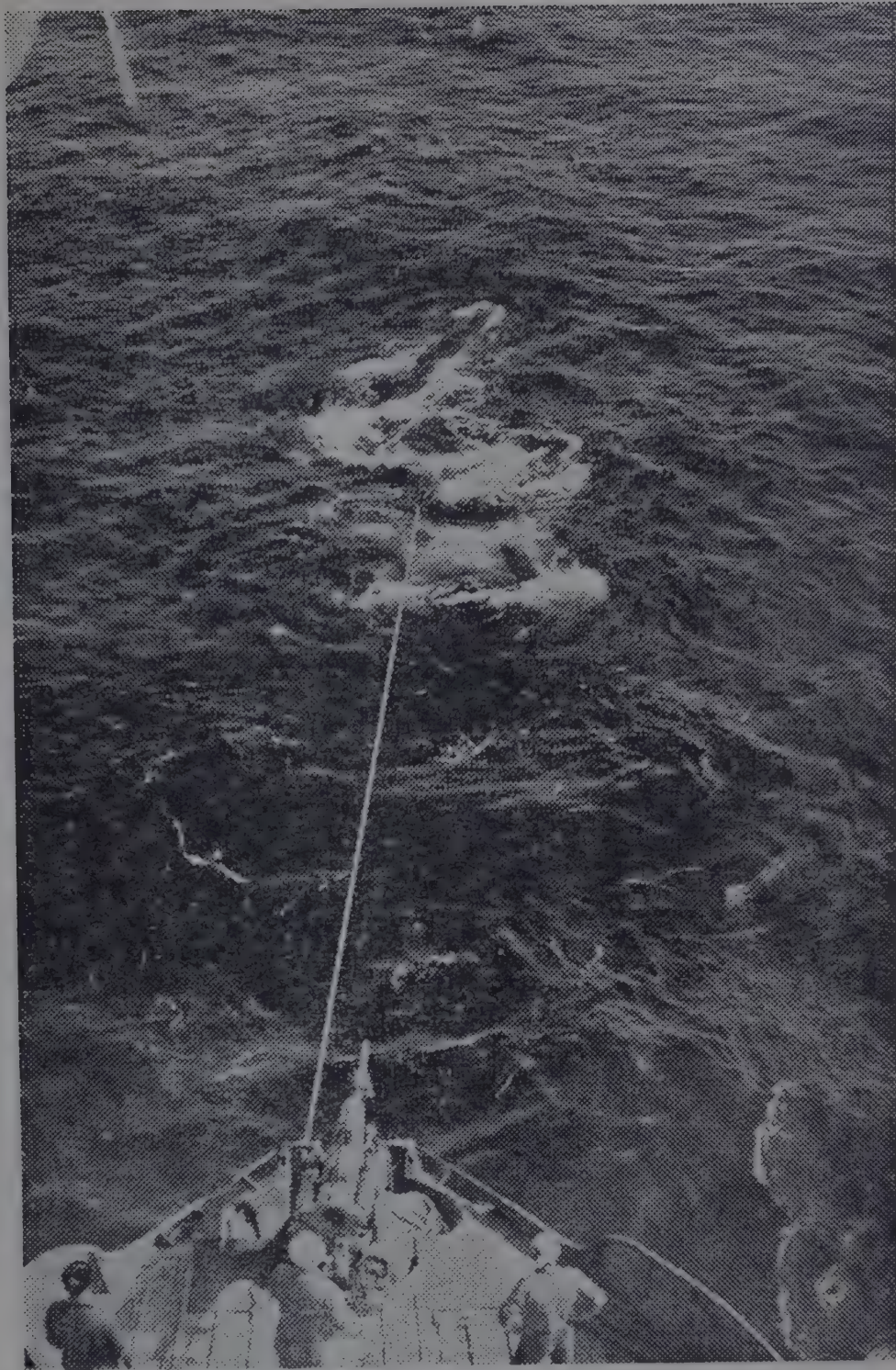
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WHALING FLEET RETURNS FROM ANTARCTICA



The Sovetskaya Ukraina, Antarctic whaling fleet, has returned from its 20th expedition. During the seven months at sea, the flagship Sovetskaya Ukraina and 20 whaling vessels covered more than 44,000 miles. Just as in preceding expeditions, the assignment of hunting sperm-whales and other whales has been fulfilled despite most trying conditions—a large number of icebergs, long storms and

*The Sovetskaya Ukraina whaling fleet.
The first Sperm-Whale on the line.
This is a formidable terror of
the ocean. Although an
8-Kg grenade hit the
whale, he does not give in.
A second shot is to be fired.*

blizzards. During such days, courage, steadfastness and ability helped the whale hunters.

For instance, a whaling boat ordinarily has to be towed to the nearest port in order to replace its screw. The seamen of Sovetskaya Ukraina started to replace damaged screws while at sea. Work which under ordinary shipyard conditions requires a fortnight was completed by whalers in three days. This is not only a record in time. Great courage is required to work in the ocean in a light diving suit.

Many other factors contributed to the success of the expedition. Gnevny, a research ship, rendered great assistance in selecting the hunting ground. Many schools of whales were

spotted by the helicopter piloted by Vitaly Ivanov.

The fleet also carried out large-scale research. Observations were conducted on all ships on the concentration of schools of whales, fish, shrimps, etc., in the waters of the southern hemisphere. These data will provide for more correctly choosing areas for whaling expeditions.

During the expedition the school for working youth functioned regularly and was attended by 295 whale hunters. Another 300 continued their studies as students of correspondence departments of higher and secondary educational establishment.

This year the Soviet Antarctic whaling fleet marks its 20th anniversary.

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NEWS & NOTES

Soviet Aid for Fisheries :

The Government of India is exploring the possibilities of entering into an agreement with the Soviet Government for assistance in the field of fisheries, it is reported. The boat-building yard proposed to be set up in Kerala with Soviet aid will also figure in the agreement, it is understood.

New Member of ISEA

M/s. Continental Fisheries, Cochin-5; have been admitted as a member of the Indian Seafood Exporters Association.

ISEA Annual General Meeting

The Second Annual General Meeting of the Indian Seafood Exporters Association will be held on 14th September 1966 at the International Tourist Home, Ernakulam, when office-bearers for the coming year will be elected. The Association is also holding its Annual Dinner the same day at 8 p. m. at the International Tourist Home, Ernakulam.

The Marine Council Annual General Meeting

The Annual General Meeting of the Marine Products Export Promotion Council is scheduled to be held at Ernakulam on the 14th September 1966. The Meeting will elect a new Vice-Chairman for the Council.

Froglegs Exports

India exported froglegs valued at about Rs. 38 lakhs during the year 1965/66, it is reported.

August, 1966

STOP PRESS

We are happy to announce that since going to press the Indian Seafood Exporters Association President, Shri Kurwath Damodaran, has been unanimously elected as Vice-Chairman of the Marine Products Export Promotion Council at its Annual General Meeting held on 14-9-66.

Shri P. K. Dewar, a Director of the Travancore-Cochin Prawn Curers' Co-operative Marketing Society Ltd., has been elected as a member of the Committee of Administration of the Council which fell vacant due to the retirement of Shri Haji A. K. Aboobacker.

—o—

The Indian Seafood Exporters Association at its Annual General Meeting held on 14-9-66 elected Shri Baby John, Kerala Seafoods, Neendakara as its President and Shri P. V. Raghunath of M/s. Hazarat & Co., Cochin as Vice-President for the next year. Seven members were also elected to the Administrative Committee of the Association.

Fishermen's Relief Fund

The Government of Madras has decided to set up a "Fishermen's Distress Relief Fund" and has sanctioned a contribution of Rs.25,000/- to it. The Fund is intended to provide relief to fishermen in distress caused by cyclonic storms, floods etc. Those in distress owing to failure of fisheries or are threatened with epidemics will also get aid from the fund.



OBITUARY

We regret to announce the demise after a brief illness of Shri Haji K. Abdul Rahimankutty, Partner of M/s. Haji A. K. Aboobacker & Haji K. Abdulrahimankutty of Calicut and Cochin, a leading Dry Fish and Dry Prawns exporting firm and a member of the Indian Seafood Exporters Association. We convey our deep sympathies to the bereaved family of the late Haji.

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VOL. 1 - No. 5

SEPTEMBER 1966

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KUNHAMBU,
Minister, Baliapatam.

26-7-1966.

Dear Sri. Damodaran,

I thank you for sending me a copy of the Journal 'Seafood Exporter' published by your Association. I am much impressed by the get-up and contents of the Journal.

With best regards,

Your sincerely,
Sd/.
(K. KUNHAMBU)

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FISHERIES, which failed to receive due recognition in the earlier plans, have figured in the country's Fourth Plan Projects also. This is just as it should be. It must be stated, however, that even the fourth plan draft presented to Parliament does not do justice to this important foreign-exchange-earner.

According to informed sources, only a little over Rs. 100 crores (out of a total outlay of Rs. 23,500/- crores), or merely 0.5% had been envisaged for development of Fisheries. Taking into account the stupendous problems facing this sector, the allotment is extremely meagre and totally inadequate. It must not be forgotten that the ocean wealth of our country is enormous. If it is properly exploited, the country could indeed earn much-needed foreign exchange. Therefore, the urgency and importance of adequate investment in this sector cannot be underestimated.

An exhaustive study of the field must be undertaken before the sea could be exploited to the maximum extent. Above all, this calls for a proper assessment of the prerequisites, not to speak of earnest efforts, to get things done in that direction. Compared to the maritime countries like Japan, Norway and Mexico which have made rapid strides and developed their fishery industry on modern lines, we in this country still cling to outmoded methods of catching, processing and curing. Even after three five-year plans it is pathetic that our fishermen are still at the mercy of the rough seas in their time-worn countrycraft at grave risks to their lives. Millions of fishermen and their families all along the 3500 miles of our coastline eke out a precarious living. Half-starved and devoid of communication facilities they live virtually

isolated from the rest of the country. This deplorable state of affairs does not redound to the credit of either our planners or our Government.

Numerous requirements of the industry at the catching, processing and export levels remain to be fulfilled. Acute shortage of ice, fresh water, power supply and cold storage facilities are instances in point. The need for a network of roads all over the coastal belt to facilitate expeditious transport of catches can never be over-emphasised. Admittedly, mechanisation of fishing operations to suit modern needs and conditions poses a big problem. But, if we have to develop the fisheries on proper lines we must have a large number of modern deep-sea fishing trawlers. Besides, we must also acquire thousands of small mechanised fishing boats. A very large number of fishing harbours have to come into existence and facilities for technical training and research have to be augmented to a very large extent. It is not the least unimportant to make modern research ships available. The need for a Fisheries University has already been suggested. All these put together call for gigantic efforts. With the meagre allotment envisaged in the Fourth Plan we wonder how the Planning Commission or the Government propose to tackle the magnitudinous problems facing the Fishery Industry.

Developed properly, this sector can make invaluable contributions to the country's economy. With proper planning and adequate financial allocations we make bold to say that the earnings of the industry could be easily increased many times. It seems to us that the Planning Commission has underestimated or inadequately understood the potentialities of this sector. The country cannot afford to neglect a source which has proved beyond doubt its utility and ability to increase foreign-exchange earnings. Neglect of such a sector can therefore, do untold harm not only to the industry but to the country as a whole.

It may not be out of place for us to emphasise that attention has also to be bestowed on proper and timely implementation of the developmental scheme envisaged in the plan as they are. In this context it is absolutely necessary for the powers that be to define unambiguously

the role of the private sector as distinct from the public sector. It goes without saying that the private sector has all along been responsible for making a major contribution to the building up of exports of seafoods. Given proper fillip, with its initiative, drive and experience it is in a supremely advantageous and unchallengeable position to increase the earnings. Facts as they are, it would only be just and proper for the private sector to expect that a major portion of plan allocations is directed towards assisting it. The public sector, of course, could in its own way profitably engage itself in building fishing harbours and roads, manufacturing Marine Diesel Engines etc.

At a time when the proposals under the fourth plan are likely to be discussed in Parliament, we strongly urge that adequate enhancement be made in the allocations to the Fishery Sector and also that a major share of such allocations be made available to the private sector so that the Fishery industry could be developed to make valuable contributions to the nation's progress.



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“Acquisition of land, an urgent necessity for concentration of fish processing industry”

— Srikumaran Nayar

ADDRESSING the fifth annual general meeting of the Marine Products Export Promotion Council here on September 14, Mr. V. M. Srikumaran Nayar, Chairman, said that in the interests of the future development of the processing industry and for constructing more ice plants, cold storages, landing jetties and shipways etc. the area between the Mattancherry Bridge and the Marakkadavu Junction should be acquired and exclusively earmarked for the purpose.

There were many obvious advantages, he said, in having the fish processing factories in a concentrated belt rather than scattered indiscriminately over a wide area.

Since the price of land in this area was steadily shooting up, he said, it was essential to invoke Governmental assistance in ensuring the expeditious acquisition of the necessary land at reasonable costs.

Speaking of tasks before the Council, Mr. Srikumaran Nayar said with a view to removing the handicap experienced in respect of high quality packing materials, the Council would work out a scheme whereby bulk purchases could be made and released to exporters according to their requirements.

He said that the Council would also study the question of frog farming and frog breeding in detail and take such measures as were necessary to ensure the conservation of the country's frog wealth. It would also examine the factors which inhibited the expansion of the exports of canned Sardines and Mackerels.

Speaking of the export target of Rs. 20 crores set for the industry under the Fourth Five-year Plan, Mr. Srikumaran Nayar said it would not be difficult of accomplishment provided steps were taken to tackle some of the immediate problems facing the industry. Fishing harbours had to be constructed. Indigenous production of large fishing vessels and marine diesel engines should be fostered. Fishing yarns and nets of synthetic material should be made available at reasonable prices. Then there was the problem of ensuring adequate supplies of ice and, therefore, a large number of ice factories and cold storages had to be put up. Ice must also be made available at a considerably lower price to make it worthwhile for the fishermen to carry ice in their boats so that from the moment of the catch, the fish could be preserved at the maximum freshness. Continuous, uninterrupted supplies of fresh water which was the most important ingredient for hygienic cleaning and processing of fish must be ensured. Refrigerated trucks which would

convey the raw material from the fish landing centres to the processing factories with the maximum possible speed had to be introduced. A net-work of good feeder roads had to be built up from the fish landing centres to the main roads leading to the various processing factories along the coastline. Besides tackling the problem of shortage of packing materials the Government will have to consider the question of issuing import licences to the processors for the essential items of machinery on an actual user basis, the Chairman urged.

Reviewing the performance of the industry, Mr. Srikumaran Nayar said in the course of the last five years exports had increased about 75%. From a figure of Rs. 3.9 crores in 1961-62, they had touched Rs. 7.06 crores in 1965-66. It was no small achievement and the industry could take legitimate pride in this. It must be remembered that the industry had been able to achieve this significant increase in exports inspite of serious dislocation in the exports of dried prawns and dry fish to traditional markets such as Burma and Ceylon, caused by the restricted buying arrangements instituted by those countries. With the development of the freezing and canning sectors of the industry and in tune with the general decline in the world trade in dried and salted seafoods, India's exports of dried seafoods had become comparatively less significant during these years.

One of the most remarkable features about the Indian shrimp industry, Mr. Nayar said, was that from the very beginning, it had been hundred percent export-oriented. In the course of the last ten years India had emerged as one of the leading shrimp processing and exporting countries in the world. Indian canned and frozen shrimps had in a short period gained consumer acceptance in highly sophisticated and quality-conscious markets in America, Europe and the Far East. They were now marketed in as many as 35 foreign countries.

Statistics of India's exports of frozen and canned shrimp during the last five years showed that there had been an increase of about 350 percent in the export earnings. As regards USA, the biggest shrimp market in the world, India was, next to Mexico, the largest supplier. The industry, however, was at present in a position to satisfy only a fraction of the effective demand from foreign markets for canned and frozen shrimp, due to the inadequacy of our catching organisations, he said.

Stating that India's present annual production of fish was about a million tonnes, Mr. Nayar thought a substantial increase in the production of marine products would be possible only by a large scale augmentation of the fishing fleet. Gone were the days when we could depend upon small country crafts going out only into a narrow coastline strip to meet our requirements of marine fish. However, fishing, even today, was mostly confined to the inshore waters while the off-shore resources remained virtually untouched. For a fuller exploitation of the resources, it was necessary to press into service large trawlers capable of operating in off-shore waters and more mechanised boats for an intensive exploitation of the inshore waters. This was all the more necessary in view of the fact that the seafood industry was already experiencing acute scarcity of catch and was constrained to keep its installed capacity idle. It would be useful, he said, if Government could grant substantial subsidies and advances for capital on longterm repayment basis to the members of the industry who show readiness to embark upon deep-sea fishing, employing modern techniques as well as the services of skilled technicians to explore and exploit the wealth of the waters.

The meeting unanimously elected Mr. Kurwath Damodaran as Vice-Chairman and Mr. P. K. Dewar as member of the Committee of Administration of the Council.

Appeal to Include Seafood Industry

in the

Cash Assistance Scheme

(Shri Kurwath Damodaran in his Presidential Speech delivered at the Second Annual General Meeting of the Indian Seafood Exporters Association appealed to the Government to bring the Seafood Industry under the recently announced Cash Assistance Scheme)

ADDRESSING the second Annual General Meeting of the Indian Seafood Exporters Association, Mr. Kurwath Damodaran, President, emphasised that the industry, a developing one, had quite a number of problems which required immediate attention and lasting remedy so that the exports may be increased.

Devaluation of the rupee, he said, was one of the most important and far-reaching steps taken by the Government since independence. The Government had to resort to this to gear up the country's economy and boost the exports, it was stated. "I have my own apprehensions about this," Mr. Damodaran said and added that this had to be followed up with several other steps for achieving the real objective. It

was true that the Government had addressed itself to this problem and liberalised imports, but internally prices of essential commodities had recorded a steady increase resulting in the rupee losing its purchasing power thereby neutralising to a large extent the expected beneficial effects of the step. He expressed the hope, however, that the Government would rise to the occasion and deal firmly with any inflationary trends.

Dealing with the Seafood Industry's problems vis-a-vis devaluation Mr. Damodaran stated that this was not likely to place the industry on a better footing. On a long term basis devaluation would be inadequate to boost the exports. The seafood exports were built up



Shri Damodaran delivering Presidential Address — seated is Shri Baby John, the new President

to its present position mainly due to incentives hitherto enjoyed by the industry. Devaluation could not replace the incentives and, therefore, Mr. Damodaran feared he did not see any prospects of increasing exports on this account.

Since, as a consequence of devaluation, the internal prices of raw products had gone up to an unprecedented level, exports would prove unremunerative and upset all calculations worked out under the Fourth Plan period. To meet this contingency, Mr. Damodaran pleaded, the Seafood Industry must be brought under a scheme of assistance to enable it to achieve the export targets during the 4th Plan period. This became more urgent and necessary because of the problems peculiar to this industry. Heavy risks are involved because of the highly perishable nature of the commodity handled by the industry. He emphasized that it was mainly for these

reasons that this industry was brought under the import entitlement scheme. Conditions had not changed since then for abolishing the incentives. He wondered how this industry which called for much more assistance than any other industry was omitted when the new cash assistance scheme was formulated by the Government. It was to be clearly understood that the import liberalisation could not substitute the incentives which amounted to a sort of bonus for the exports. It was a source of encouragement to exporters who were called upon to shoulder heavy risks. Mr. Damodaran, therefore, appealed to the Government to include the Seafood Industry also in the scheme of cash assistance announced recently.

Mr. Damodaran said that the crux of the problem was the shortage of raw products. There remained a wide gap between production

and export demand. So long as this position continued the internal prices would continue to shoot up and make exports uneconomical. Devaluation was no answer to this problem, he said and went on to say a study of the prices prevailing in foreign markets and the internal prices would reveal that the basic need of the day was increasing the availability of raw products. This Association was drawing the attention of the Government to this basic problem but it was most regrettable that this aspect had not been given due consideration by Government. Unless it took steps to equip the industry with deep-sea Fishing Trawlers the industry which was urged to increase the exports to Rs.25 crores would disappoint the planners. On the other hand if deep-sea fishing trawlers were made available to the industry on easy payment terms, he felt confident that the vast field at the disposal of the country could be exploited so as to achieve an export target of Rs. 30 crores or even more. Mr. Damodaran expressed the hope that the Government would give top priority to this matter and provide the industry with these essential requirements.

After pleading for adequate allotments for the development of the seafood industry under the Fourth Five-year Plan, Mr. Damodaran urged Government should help tackle the problems facing the industry in a realistic way.

Dealing exhaustively with the advent of the Kerala Fisheries Corporation and its ill-effects especially on the small exporters, Mr. Damodaran drew pointed attention to the fact that several of them had been thrown out of the trade. The remaining few in this category who were utilising the excess capacity of private plants also may, in the long run, go out of business because of their inability to withstand the severe competition from the Corporation

which undoubtedly had vast resources at its command. The field would then be at the disposal of the monopolistic group "whose invisible hands were mainly responsible for the formation of the Corporation inspite of protests from various quarters including our Association." There had been assurances from the Government of India in the past that there would not be any competition between the private sector and public sector. But here was an instance which was a clear negation of such assurances, Mr. Damodaran said and added "I don't find a similar instance in respect of any other industry." He asked why, then, had the Govt. singled out this industry for an experiment and adventure of this nature. "We have been seeking to get an answer to this but so far we have got none".

Mr. Damodaran referred to the series of steps taken by the Association in focussing public attention on the dangers to a section of the industry from the Corporation and expressed satisfaction over the fact that evidently there had been a rethinking on the part of the Govt. on the subject because the Govt. had assured the Association of continued assistance to the Fisheries Co-operatives. The reported cancellation of the proposed centrally-sponsored Fisheries Corporation with foreign collaboration also went to prove that the Govt. had realised the mistake.

Expressing his satisfaction over the successful return of all the candidates sponsored by the Association in the recent elections to the Marine Products Export Promotion Council Mr. Damodaran hoped the majority now enjoyed by the Association on the body would help to serve the interests of the industry in an increased measure.

Second Annual General Meeting of the Indian Seafood Exporters Association

AT the Second Annual General Meeting of the Indian Seafood Exporters Association held on September 14 at the International Tourist Home, Ernakulam, the following members were elected as office bearers for the next year.

President :

Shri Baby John,
Proprietor, Kerala Seafoods,
Neendakara, Quilon.

Vice-President :

Shri P. V. Raghunath
of M/s. Hazarat & Co., Cochin-2.

Treasurer :

Shri K. K. Raghavan,
Partner, M/s. K. E. Kesavan & Co.,
Cochin-2.

Administrative Committee Members :

Shri N. C. Koli,
Managing Director, Maharashtra Rajya
Machimar Sahakari Sangh Ltd., Bombay.

Shri M. V. Thomas,
Director, Travancore Cochin Prawn
Curers' Co-operative Marketing
Society Ltd., Cochin-2.

Shri M. Kaderkutty
of M/s. Haji A. K. Aboobacker and
Haji K. Abdulrahimankutty, Cochin-2.

Shri P. V. Avira Tharakan
of M/s. Atsonco, Ezhupunna,
Alleppey Dist.

Shri J. A. Balachandran
of M/s. M. A. Charles Fernando & Bros.,
Tuticorin.

Shri Abdulrahiman Haji Jacob Sait
of M/s. Ismail Haji Jacob & Bros.,
Cochin-2.

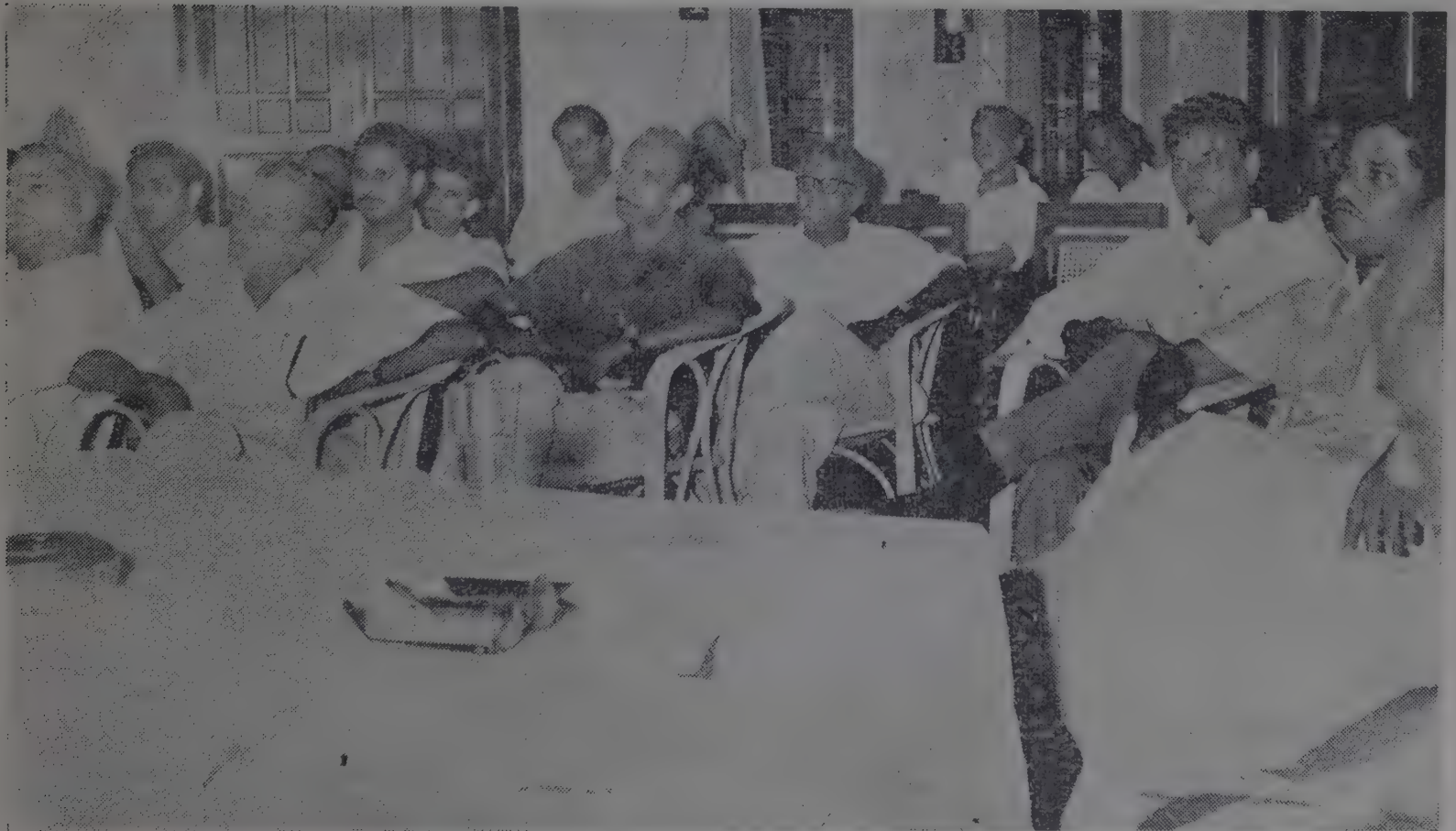
Speaking after the election Shri N. C. Koli paid glowing tributes to the services to the Association of the retiring President Shri Kurwath Damodaran and congratulated him on his election as Vice-Chairman of the Marine Products Export Promotion Council. Shri Koli stated that the members of the Association were greatly indebted to Shri Damodaran. It was only due to his untiring efforts that the Association had reached its present position. Shri Koli expressed his sorrow over the retirement of Shri Damodaran from the Presidentship but he felt that the latter who was devoting more of his time to the Association should be given some relief. Shri Koli wished Shri Damodaran well in his new assignment and himself being a member of the Marine Products Export Promotion Council and its Committee of Administration assured him of his whole hearted co-operation.

Welcoming and congratulating Shri Baby John the newly elected President of the Association Shri Koli said that Shri Baby John was undoubtedly one of the most suitable persons to succeed Shri Damodaran. He also offered the new President his unstinted co-operation.

ISEA COMMITTEE MEMBERS

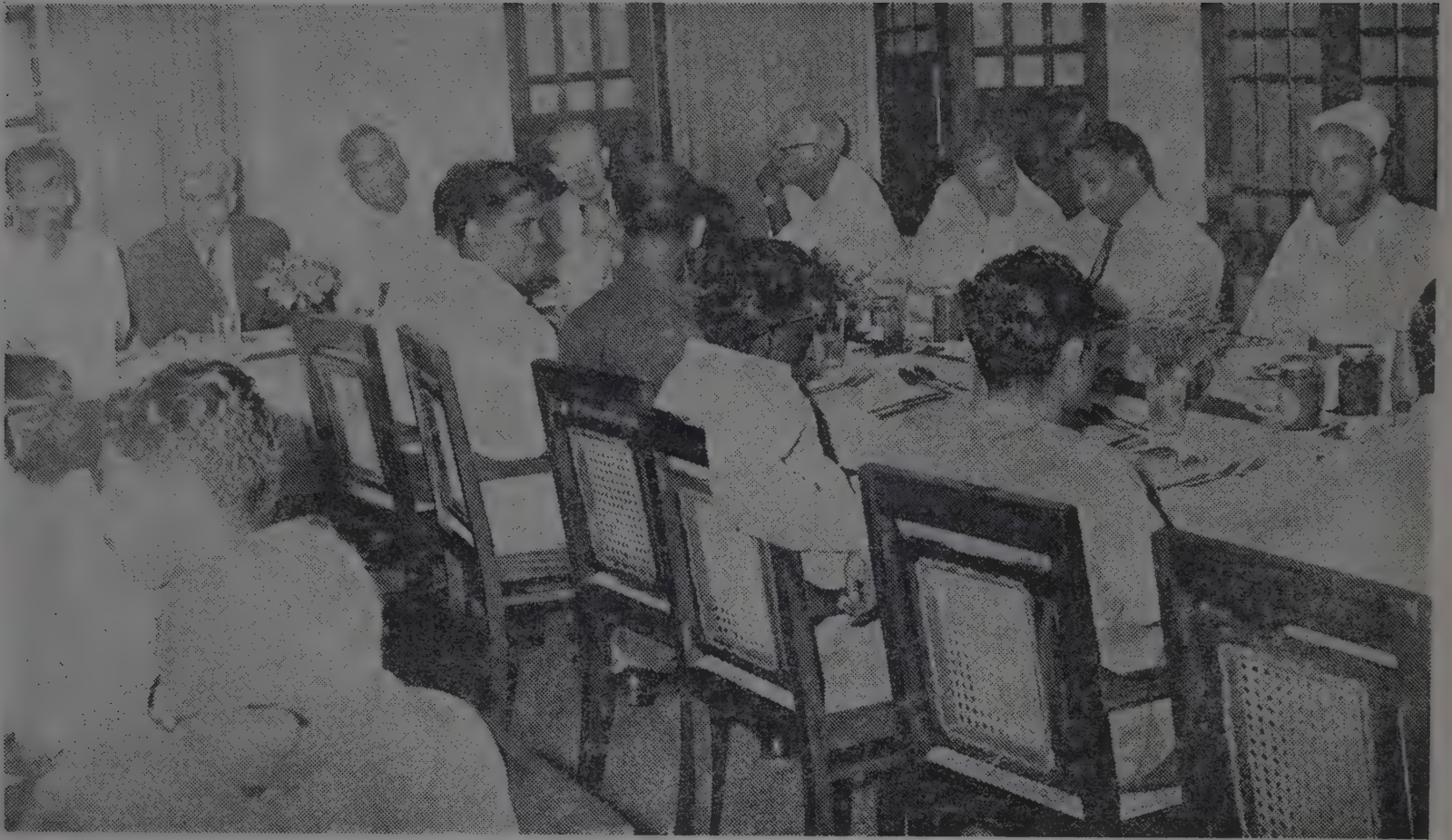


L. to R. *Sarvashri N. C. Koli, P. V. Aviratharakan, Kurwath Damodaran (Retiring President), P. V. Raghunath (Vice-President), M. V. Thomas, Baby John (President), M. Kaderkutti, Abdul Rahiman Haji Jacob Sait, K. K. Raghavan and J. A. Balachandran.*

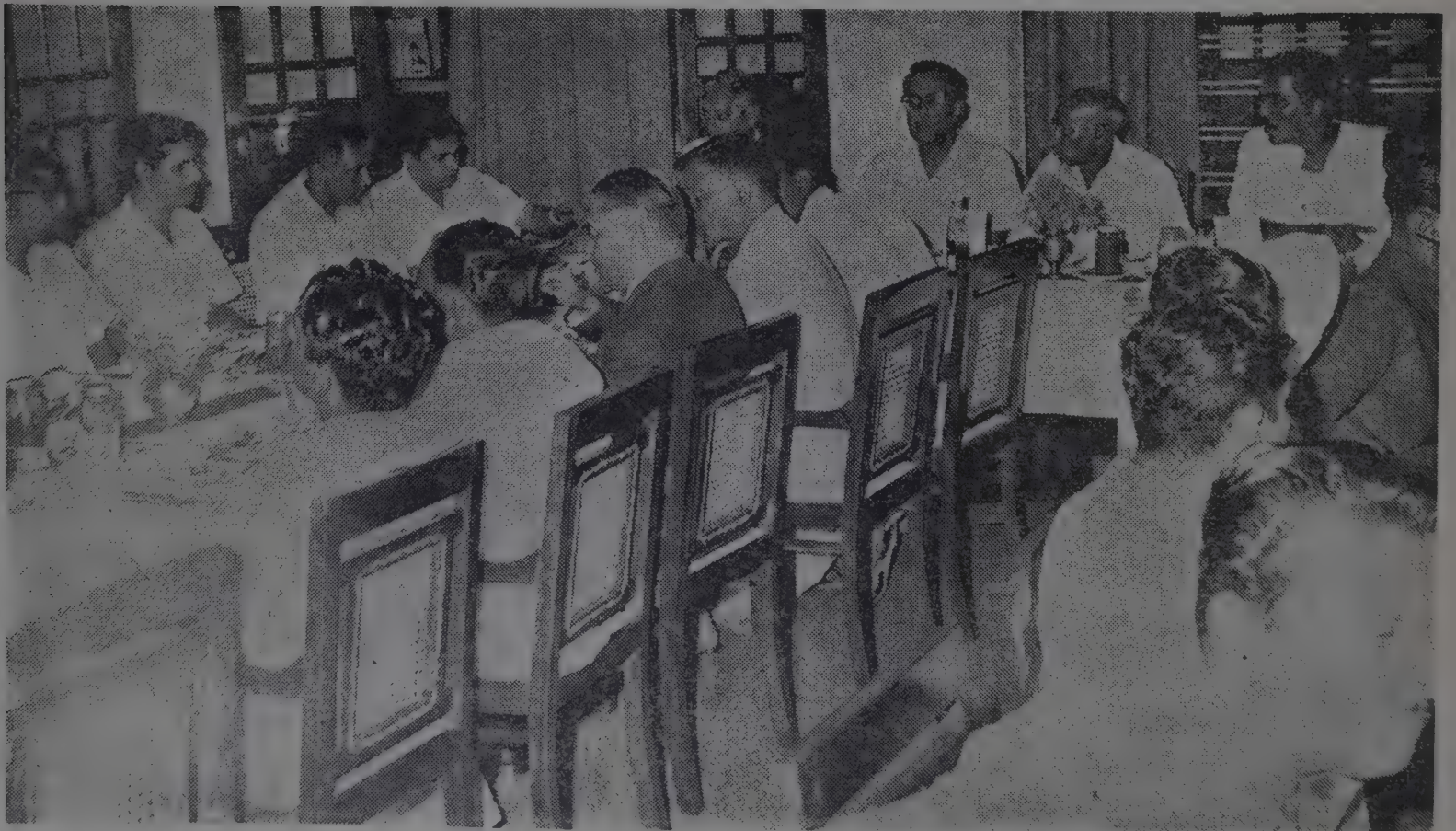


A Section of the audience at the Annual General Meeting

AT THE ANNUAL DINNER



Mr. Baby John (Extreme left). To his left are Mr. V. M. Srikumaran Nair, Chairman, Marine Council; Mr. N. C. Koli & Mr. C. G. Tucker.



Mr. Baby John, the New President (Extreme right) with Mr. Kurwath Damodaran and Mr. P. Madhavan Nair, Deputy Chief Controller of Imports & Exports, to his right.



Shri N. C. Koli addressing the meeting. Seated to his right are Shri Baby John and Shri Kurwath Damodaran

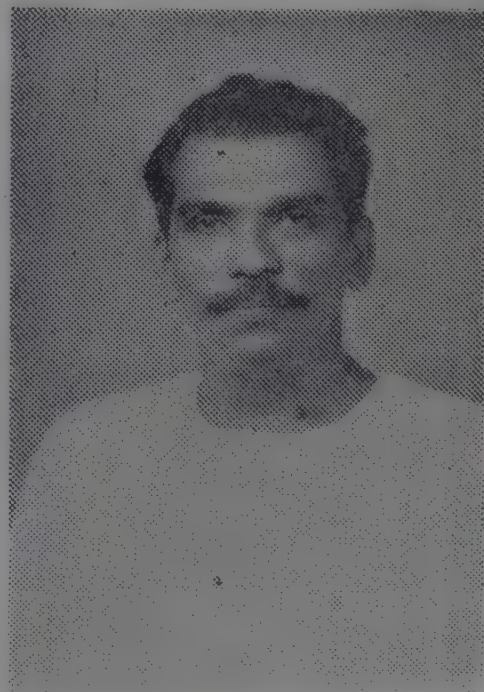
Shri Koli then moved a resolution recording the Association's great appreciation of the valuable services rendered by Shri Damodaran, which was passed unanimously.

Shri P. S. Damodaran of M/s. Solar Fisheries spoke congratulating Shri Kurwath Damodaran on his election as Vice-Chairman of the Marine Products Export Promotion Council. He also congratulated the new President of the Association, Vice-President and members of the committee on their election to the respective positions and offered them full co-operation.

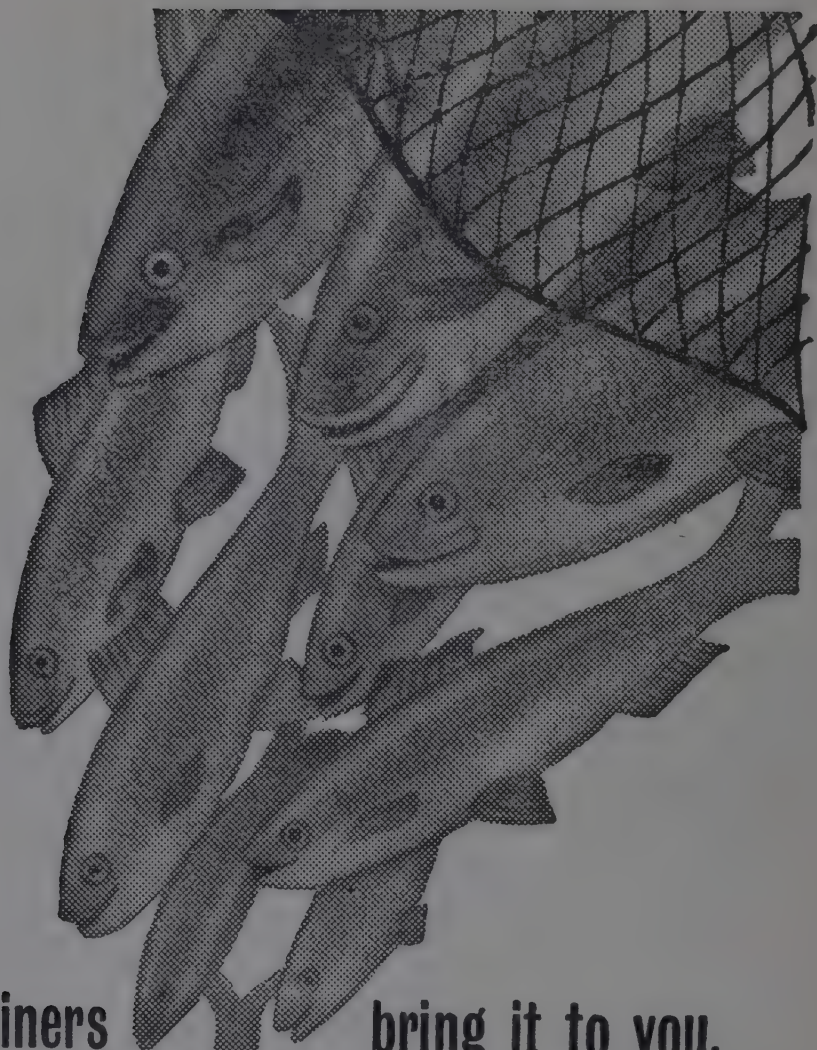
Shri Baby John, the new President then spoke narrating the history of the Association and the difficulties and problems that had to be faced by them during the period following the formation of the Association. He said that the Association during the short period of its existence, in spite of the various difficulties, had been able to gain appreciable strength and he attributed this to the able guidance of Shri

Damodaran, whose retirement will be a great loss to the Association. But at the same time he felt very happy that Shri Damodaran had been elected as Vice Chairman of the Marine Products Export Promotion

Council, which gave him better opportunity to serve the industry. He congratulated Shri Damodaran and appealed to him to continue to guide the Association's activities. Continuing Shri Baby John said that he was indebted to the members



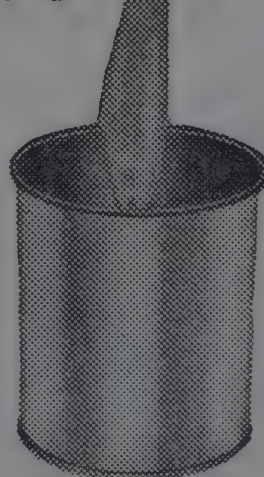
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for electing him as President of the Association. He was aware that the position involved heavy responsibilities. However he assured the members that he would strive his utmost for the betterment of the Industry and progress of the Association. He appealed to members for their unstinted co-operation in the discharge of his duties.

Shri P. V. Raghunath, the new Vice-President then congratulated Shri Damodaran on his election as



Vice - Chairman of the Marine Council. He also congratulated the new President of the Association Shri Baby John. He thanked members for electing him as Vice-President and assured them that he would always endeavour to serve the Industry and the Association to the best of his ability.

The Annual Dinner held in the night at the International Tourist Home was well attended. Important among those present were Shri V. M. Srikumaran Nayar, Chairman, Marine Products Export Promotion Council, Shri P. Madhavan Nayar, Deputy Chief Controller of Imports and Exports, Shri John P. George, Director, Island Seafoods Private Ltd., Shri Y. M. Elias, Director, Indo-Marine Agencies (P) Ltd., and Shri P. K. Nayar, Director, M/s. Cochin Company (P) Ltd.

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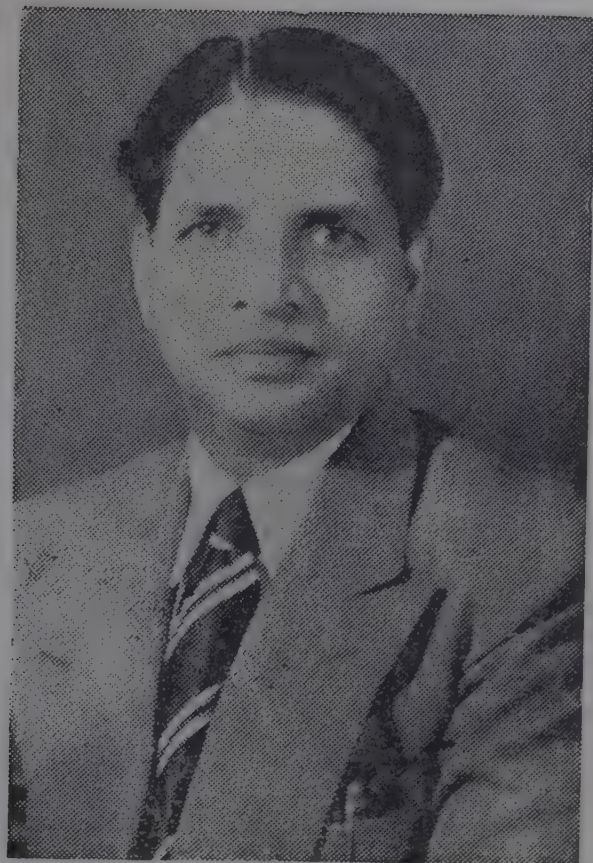
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Plea for Fishery University



Shri M. P. Alexander, till recently Chairman of the Marine Products Export Promotion Council has made a forcible plea for starting a Fishery University in India. Shri Alexander who was speaking at a farewell Luncheon got up in his honour by the Indian Seafood Exporters Association, Cochin, at the International Tourist Home, Ernakulam, on September 27, cited the example of Japan where there were two Fishery Universities. He said an exhaustive study of the Fishery wealth called for the services of trained personnel in large numbers. To facilitate training and research in modern lines, therefore, a Fishery University was essential. Mr. Alexander also stressed the need for a large number of Fishing Trawlers for usefully and profitably exploiting our seas. In this connection, he cited the covetable progress made by countries like Japan and Mexico where they operated trawlers fitted with most modern equipments capable for trawling for days together till they located a fishery bed. This eliminated the

possibility of trawlers returning without catches. Shri Alexander also drew pointed attention to the various other problems facing the seafood industry, namely shortage and high price of Ice, provision of adequate fresh water supplies, feeder roads etc., and suggested that solution should be found for these.

He thanked the members of the Indian Seafood Exporters Association for their goodwill towards him and wished the Association and its members well.

Earlier Messrs. N. C. Koli, P. V. Avira Tharakan, J. A. Balachandran and P. V. Raghunath praised Shri Alexander for his ability in guiding the seafood industry and his contributions to its progress, and wished him Godspeed in his new assignment. Shri Kurwath Damodaran recalling some of his experiences while on tour of foreign countries in the company of Shri Alexander said Shri Alexander always approached the problems in a diplomatic way. He paid high tributes to

Shri Alexander, who, he said, rendered valuable services to the seafood industry.

Shri Baby John, President of the Association praised Shri Alexander for his devotion to the cause of the industry which was dear to him. He also said that his services and contributions to the industry which achieved great success during his Chairmanship of the Marine Council will be remembered for long.

Several members of the Association took the opportunity for welcoming Shri V. M. Srikumaran Nair, the newly appointed Chairman of the Council and assured him of their utmost co-operation in fulfilling the task

awaiting him. With his long experience and all-round knowledge, they were confident that the new Chairman will give the industry and all those dependent on it his valuable advice and guidance.

The Luncheon was attended among others by Mrs. Alexander, Shri V.M. Srikumaran Nair, the newly appointed Chairman of the Marine Council, Dr. A. N. Bose, Director, Central Institute of Fisheries Technology, Shri T. O. Cherian, Deputy Director, Export Promotion, Shri A. I. George, Director, Indo-Norwegian Project, Shri M. P. Haran, Secretary, Marine Council, Mrs. Kurwath Damodaran and members of the Indian Seafood Exporters Association.



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FREEZE-DRIED FOODS

MANMOHAN SINGH
Managing Director, Frick India Limited



DRIED Foods have been known for about 20 years as a tasteless necessity when fresh foods are inaccessible, out of season or are difficult to transport. However, the development of freeze-dried foods has revolutionised the preservation and marketing techniques of perishable foods. Fresh meats, vegetables and many other varieties of foods can now be handled, preserved and marketed in their original size, shape and texture in just about as good a condition as fresh.

The triumph of food technology culminates efforts reaching back to the days of cave man. People through the centuries learned how to smoke meats and fish, and how to sun-dry fruits. Later, the use of spices and early preserving methods were introduced. These led to the splendid canned foods of to day. Mechanical refrigeration made possible the great cold storage industry as we know it, following which came quick-frozen foods, then concentrates, and with them the highly economical heat-pump applications.

Freeze-Drying

Freeze-drying is accomplished by sublimating all the moisture from the frozen perishable foods without letting the moisture melt. This is done in a turn-key vacuum. The moisture of the frozen food is turned into low temperature vapour without going through the liquid stage, which would carry away essential flavours and food values since such flavours and food values are soluble in water.

The frozen foods are loaded on shelves, on a movable truck and are dried at a temperature well below freezing in chambers which are rectangular externally reinforced made of carbon steel. To minimise heat from the chambers, all internal surface are finished with white plastic coating having high heat reflectivity. The chambers are mounted at a convenient working level for fast and easy loading. The shelves in the chambers are finished in heat resistant highly emissible plate plastic coating. The shelves are equipped with temperature level control to maintain proper drying conditions to condense the moisture that sublimates from the frozen foods. Proper condensers are provided with ample capacity with a refrigerated place for handling the vapours.

Enough refrigeration is provided to develop 750 microns of vacuum in the condenser. Generally the temperature of the condenser is maintained around -40°C (-40°F).

The vacuum system is designed to create a vacuum of 1 mm mercury from atmospheric pressure in approximately five minutes in all the sections, i.e., chamber, condenser and the piping. This vacuum is created by special vacuum pumps.

The frozen foods are dried at a temperature well below freezing. Heat-energy is provided to the plates in the chamber from electricity source. The great volume of low-temperature moisture vapour resulting would quickly destroy the vacuum, or overload the pumps, but for the

presence of refrigerated plates in the condenser. The ice thus formed in the condenser plates is melted by hot gas, after the door of the vacuum chamber has been opened and the foods moved into a dry room for packaging. Glass containers or sealed cans or moisture-tight triple-laminated bags are used. The foods can then be kept for months without refrigeration. Water is of course added to reconstitute the foods.

Frick low-temperature equipment has been applied to several freeze-drying systems using cascaded hook-up of refrigerants 13 and 12 or 22. Experiments are now being conducted to shorten the time required for freeze-drying, which is practically 8 hours for a batch. The overall cost of the process now has also come down considerably making the process an economically viable one for marketing purposes.

In the freeze-dried products the weight of the food is reduced to 20% of the original weight, thus making transportation of such food not only practicable from the preservation point of view, but also economical on account of very little space that it takes.

Expensive and difficult refrigeration transports are not required to carry freeze-dried products. These products can be stored in ordinary ambient temperatures.

Quality

Quality is always a measure of a food's potential. Freeze-dried products are no exception. So there is considerable interest in taste tests made by USDA in America recently. Details are not available, but highlights are reported by Agricultural Economist Bird. Quality ratings necessarily are affected by both processing and packaging.

Samples of 23 freeze-dried products now on the market were taste-panel tested. The tasters compared each freeze-dried product with the same item processed in another way. The standard in most cases was either frozen or canned. Products were tested for general acceptability, then specifically for appearance, flavour, texture, dryness and tenderness.

USDA's analyst Bird makes these general evaluations: Poultry meat and several of the red meats have a potential market. Cooked hamburger rates well, relative to frozen. So does ham. Several sea foods, particularly shellfish, already have been market tested. They appear to be assured successes. Asparagus, broccoli, Brussels sprouts and several other vegetables have real potential. Mushrooms are a "natural" and will be freeze-dried in large quantities.

There is a market for most berries and for some fruits. These seem to be earmarked for specialized uses as in the institutional trade or manufacturing.

Speciality foods such as seasonings, spices, coffee, fruit powders and beer are promising items. Some of these are not far off in the future, either.

End-Use Potentials

USDA investigators also have examined freeze-drying potential from the viewpoint of end uses. Among their observations are these:

For institutional sales, shellfish, fish, meats and vegetables, are readily adapted to portion control. So to some companies, this \$20-billion market appears most promising.

As ingredients in other foods, freeze-dried items are seen improving the quality and natural characteristics of processed foods. Freeze-dried can be added to soups, preserves, desserts such as gelatin, puddings, ice cream, and bakery items. The quality of gelatin desserts might be materially enhanced by adding freeze-dried strawberry powder as a flavouring ingredient.

Several large food manufacturers currently are using freeze-dried products in this manner. And this, according to USDA's analyst, probably constitutes the largest commercial market for the products. It is an outlet for a very sizeable volume of freeze dried items.

Speciality items are evaluated as perhaps having the greatest impact. Instant coffee is specifically cited. Also mentioned are seasonings, powders, and spices. Items such as parsley, thyme, and tarragon and wintergreen can be dried whole. Powders would include orange and lemon peel, oregano and members of the onion family.

Problems to be faced

There are some drawbacks to the freeze-dehydration process. Complex equipment is required and an extensive consumer education programme will be necessary to remove the stigma dehydrated foods suffered during the war.

What's more, technological difficulties must be solved before it's economical to process foods more than $\frac{1}{2}$ " thick. It takes extra time to freeze-dry extra thick sections.

There is no doubt that a freeze-drying industry is coming into existence. The process is here to stay. It remains now but to separate the theoretical academic literature and dis-

cussions, which confront the food processor, from the practical. Also, it is necessary to establish the down-to-earth aspects of how, where, and when freeze-drying can be used at its economical best.

But the truth of the matter is that freeze-drying is not any more expensive than other methods of food preservation. In many instances it is more economical than freezing when considering final distribution or retailing.

For those in the frozen food industry already familiar with the prerequisites of freeze-drying, steps required to enter this new field are simple and straightforward. Rather than a replacement process for freezing foods, freeze-drying is a logical adjunct offering the possibility of expanding into new markets.

The U. S. Army is consuming \$2-billion worth of these foods as field rations. Freeze-dried chicken and shrimp were introduced into the Army supply system in the last couple of years. In 1963, the Army and Air Force used more than $\frac{1}{2}$ million lbs of freeze-dried meat, poultry and sea-food

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NEWS & NOTES

Commercial Concentrations of Shrimp in Alaskan Waters

According to a report from the U.S. Bureau of Commercial Fisheries' Juneau, Alaska, office, a recently completed survey in waters adjacent to Prince of Wales Island in Southeast Alaska revealed significant concentrations of shrimp. The 8-week survey revealed large concentrations of Alaska shrimp in Hetta and Klakas Inlets and Moira and Chomondeley Sounds where catches ran as high as 313 pounds per station, and averaged 132 pounds per station. The shrimp ranged in size from 12 to 18 whole shrimp per pound. Total catch for 38 stations was 5,018 pounds or 1.88 pounds per trap per set. The highest catch for an individual trap was 15 pounds. A marked difference in trap efficiency was noted, the catch for six models tested ranging from an average of 1.05 to 2.63 pounds per trap per set. Two commercial vessels have begun fishing in these areas, and their catches are marketed in Ketchikan at prices reported in the Neighbourhood of \$ 1.50 per lb. for tails. The recovery of tails from round weight is approximately 45 percent.

French Guiana Production increasing

The total shrimp catch of 2 U. S. controlled shrimp companies operating in French Guiana increased to about 1,690 metric tons in 1965, valued at about \$3.2 million. Production in 1964 was 1,369 tons. One firm plans to operate 39 vessels this year and purchase 10 additional trawlers for 1967.

Growth of Shrimp Exports to U. S.

In 1940 five nations exported shrimp to the U. S., in 1950 eighteen nations exported shrimp to the U. S., in 1963 fiftythree nations exported shrimp to the U. S., and in 1965 sixty-six nations exported shrimp to the United States. Since 1940 exports have risen from 5,024,000 pounds to 163,088,000 pounds.

New Members of the ISEA.

The following new members were admitted into the Indian Seafood Exporters Association.

1. M/s. Ebrahim Mohamed Hashim & Bro ,
P. B. No. 213 Cochin-2
2. M/s. Crown Fisheries, P. B. No. 199
Cochin-2
3. M/s. Ramaniklal & Co., Bombay-4.

Norwegian Gift Trawlers.

3 modern deep-sea Fishing Trawlers, a gift from the Government of Norway, are due to arrive in Cochin in the first half of October. The Trawlers will be handed over to Shri Panampilly Govinda Menon, Minister of State for Food and Fisheries, Government of India.

Fishery Project at South Canara Coast.

A fishery project involving an investment of Rs. 1.25 Crores and production capacity of 15,000 tons per annum is proposed to be started at the South Canara coast. It is estimated that

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The proposed project will earn a foreign exchange of Rs. 18 lakhs per year. The project aims at putting into operation 240 mechanised fishing boats in stages. 11,000 fishermen are expected to be benefited thereby.

Crown Fisheries.

This firm, a new-comer to the industry has installed a Freezing Plant and started production.

Solar Fisheries.

Another new-comer has also put up its Canning Plant and commenced production.

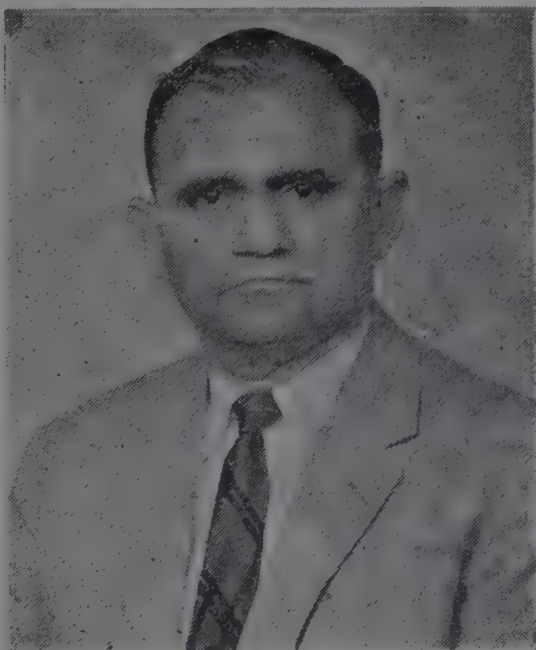
Continental Fisheries.

This firm has recently started exporting Canned Shrimp from its newly-installed Canning Plant.

M/s. Hazarat & Company

M/s. Hazarat & Co., Cochin, have installed their first Freezing Unit at Cochin from where they have started freezing operation recently. This firm, it is stated, has plans to put up a large scale

Freezing Plant, Ice Plant & Cold Storage for which the necessary and had been acquired at Madras. Thus the senior partner of this firm Shri Pravir Vijayaraj Hazarat who



owns the Coco-Cola plant at Ahmedabad and the Menora Hosiery at Bombay evinces keen interest in the expansion of their Seafood processing unit at Cochin.

Kerala Mechanised Fishing Vessel Owners Association

A special general meeting of the Kerala Mechanised Fishing Vessel Owners' Association, Cochin-2, held on Sept. 18, at La Bella Hotel,



Cochin-2, elected Prof. L. M. Pylee, M. A. B. L., Ex-minister as its new President. Prof. L.M.Pylee was the Principal of St. Albert's College, Ernakulam for quite a long time when he was elected as the Minister for Education of

the erstwhile Travancore-Cochin State. He was, for sometime, the speaker of the Legislative Assembly also. Prof. Pylee's election as the President of the mechanised Fishing Vessel Owners' Association is very fitting because, as a boat owner himself, he is fully aware of the problems facing the fishing vessel owners. The present office bearers of the Association are:-

1. Prof. L. M. Pylee, M. A. B. L. (President)
2. Shri K. K. Kumaran, M. A. I. R. E.
(Vice-President)
3. Shri K. B. Menon, B. A. (Hon. Secretary)
4. Shri G. S. Pai (Treasurer)
5. Capt. Paul J. Mampilli, B. A. B. L.
6. Shri P. L. Jose, B. A. B. L.
7. Shri M. Pooppally, M. A. B. Sc.
8. Shri M. M. Cherian
9. Shri K. K. Raghavan

10. Shri Joseph Valooran

11. Shri A. I. Benny.

We congratulate the new President and the office bearers and wish them every success.

XL Seafoods

XL SEA FOODS, Cochin-5 have brought their second canning Plant into Production. This modern plant and factory situate at their premises at Karuvelipady, Cochin, enjoying both road and water front facilities.

The addition of this second Canning Factory, with a production capacity of about

20,000 cans, per day is designed to augment supplies of their well-known brands, to meet the growing demands of their distributors, all over the world. This marks another 'Corner Stone' in their developmental schemes. "XL" is soon going to adorn another feather by the addition of their own ICE PLANT at Thoppumpady, it is learnt.

Fish Meal Plant for Cochin.

A Fish Meal Plant with a Two-tonnes per day capacity will shortly come up at Cochin, in the Public sector, it is learnt.

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U. S. Shrimp Imports, All Types

Country of Origin	July		Jan-July		Total 1965
	1966	1965	1966	1965	
(In Thousands of Pounds)					
Mexico	3,698	4,382	31,705	29,608	59,936
Guatemala	333	85	1,229	933	1,516
El Salvador	466	310	3,089	2,608	5,376
Panama	1,515	937	5,718	6,197	10,266
Colombia	231	112	1,166	821	1,796
Venezuela	322	1,065	1,672	10,175	12,720
British Guiana	826	769	4,785	4,695	7,972
Ecuador	595	270	3,173	2,797	5,665
India	1,368	742	8,946	8,230	14,275
Pakistan	292	205	4,241	3,233	6,566
Japan	123	167	1,423	1,373	2,505
United Arab. Rep.	43	...	165	388	475
Other Countries	2,661	2,843	24,299	19,467	34,020
Total	12,473	11,887	91,611	90,525	163,088

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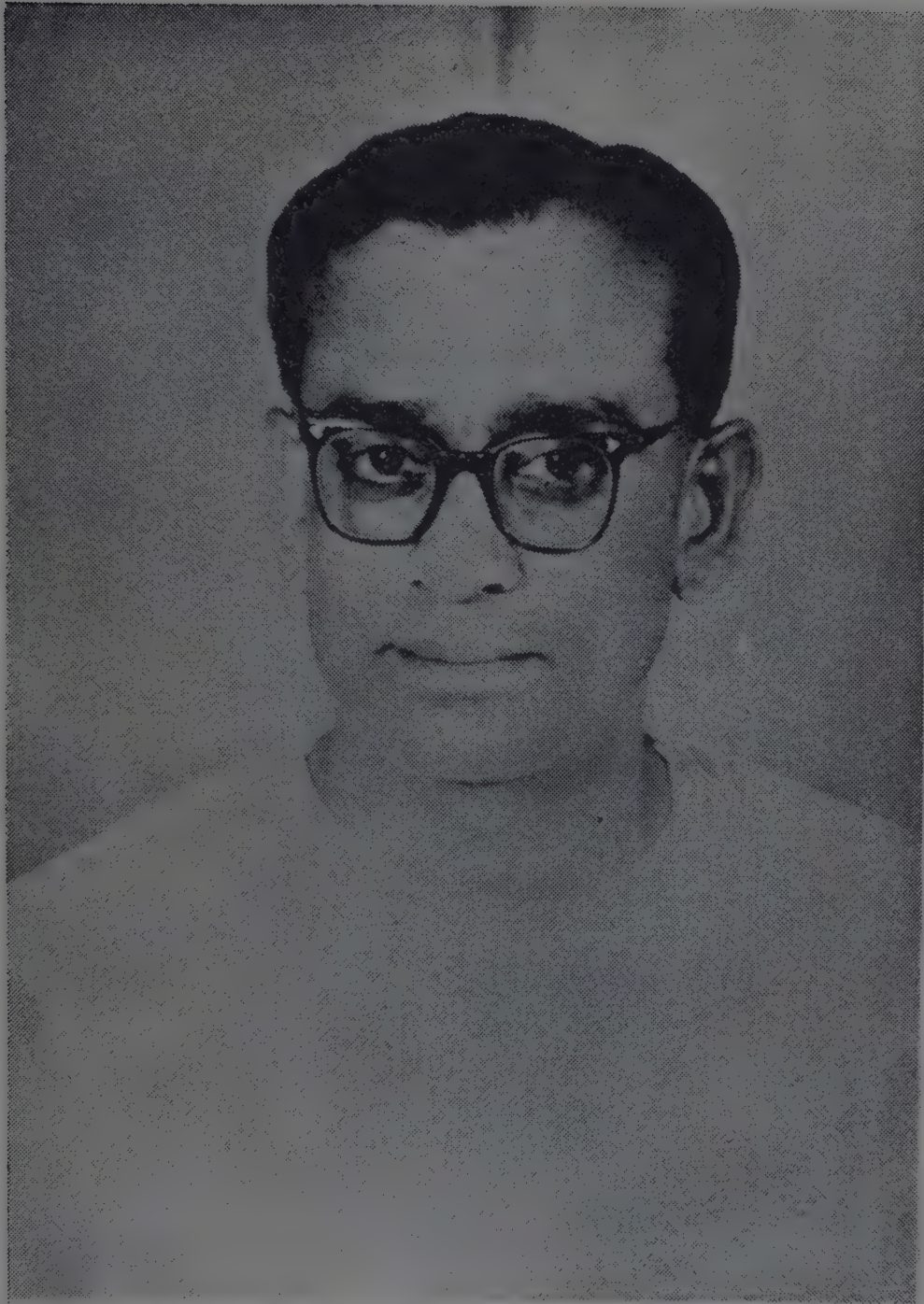
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Editorial

DRIED Prawns, an important item in the country's export trade, have lately received a serious setback. Burma has been the traditional bulk importer of this commodity for a long time. With nationalisation of imports in that country, India's exports of Dried Prawns have been recording a steep decline. Now and for the past one and half years no orders have been received from Burma. This development has not only caused great concern to the trade but brought about distress among thousands of fishermen, their families and all those depending on it for their livelihood. For many decades Kerala has been holding a monopoly in the Dried Prawns trade and, consequently, the State's economy is closely linked to the vicissitudes of this business.

Though we have repeatedly brought the situation to the notice of the Government and requested them to take effective steps for the revival of the exports to Burma, nothing appears to have been done in that direction. Perhaps with their growing interest in freezing and canning industry, they may be inclined to neglect the Dried Prawns. Mention must be made here that while a good part of the catches is channelised into the freezing and canning industry, a substantial quantity consisting of those varieties which are not fit for freezing or canning still goes to the curing yards. Inadequacy or lack of efficient and speedy transport facilities, it must be remembered, also necessitates conversion of available catches into dried prawns. We are sure, therefore, there is no justification for continued neglect of this trade on any account.

Dried Prawns form an important item in the menu of the Burmese. In the past India has been exporting to Burma approximately 4000 to 5000 tonnes annually on an average which, at the present valuation, would earn for the country from Rs. 2 to 3 Crores

Whether it is due to its new-found affection for the frozen and canned varieties which showed a good record of performance or other reasons,

the authorities cannot remain tight-lipped in regard to the loss of the Burma Market. There is so much of stake in it for all those who are depending on it. A steady increase in exports in other directions need not eliminate the need for exploring the possibilities of resuming exports to Burma or even other countries. As we have said above, Burma has been consuming large quantities of Dried Prawns and over a period of years our country had placed its reliance entirely on that country. And, what is more, we have not so far been able to find any other alternative market capable of consuming such bulk exports. Just as India is importing rice from Burma, though with reluctance, to meet part of Kerala's food requirements, ways and means, we suggest, should be found to persuade Burma to take Dried Prawns which they have been importing all along. If need be, pressure must be brought to bear on Burma for the purpose while concluding trade agreements with her. Substitution of other items in the trade agreements at the cost of Dried Prawns, we regret to say, has in a large measure contributed to the present sorry state of affairs. Repeatedly we have pointed out the need for concluding a barter arrangement with Burma whereby we could export Dried Prawns and accept Burmese rice in exchange. Though the Government has resumed its purchase of rice from Burma, there is as yet no indication of the possible resumption of Dried Prawns exports to that country.

No tangible effort has been made in finding alternative markets for Dried Prawns either. For small quantities inquiries have been forthcoming from other parts of the world. These potential consuming countries have to be thoroughly exploited in an effort to build up substantial exports. In addition to earnest efforts in that direction effective propaganda and sales promotion drives must be undertaken abroad, especially in Hong Kong, Japan, Malayasia, Singapore etc., in the Far East and U. S. A., Canada, Holland etc., in the West. The African markets have also to be tapped. Trade delegations should be sent to these countries including Burma with a view to assessing potentialities and establishing vital connections for the future. Earnest efforts made in that direction, we are confident, will go a long way in securing sorely needed results. We suggest, therefore, that the Government should, without loss of time, address itself to the task of rehabilitating the Dried Prawns trade which has been making a valuable contribution to the country's foreign exchange earnings. The country can never, least of all at present, afford to allow such an export trade to be wiped out of existence.

Rs. 113 CRORES FOR FISHERIES IN FOURTH PLAN

Emphasis on Quick-Yielding Schemes



IT is proposed to provide Rs. 113 crores for development of fisheries in the fourth Five Year-Plan against Rs. 29 crores which had been provided in the Third Plan. This was disclosed by Shri. C. Subramaniam, Union Minister for Food and Agriculture, while inaugurating the meeting of the Central Board of Fisheries, at Madras.

Addressing the meeting which included Ministers from various States, representatives of fishing interests, technologists and representatives of various Governmental agencies for development of fisheries who comprise the Board, Shri. Subramaniam said that out of Rs. 113 crores in the Fourth Plan, it was proposed to provide Rs. 52 crores for marine fisheries, Rs. 17 crores for inland fisheries and Rs. 44 crores for research, training, pilot schemes and the like.

The object of the investment would be to obtain as much fish as possible both for internal consumption and for export.

Quick Yielding Projects

To achieve this objective, Shri Subramaniam said it may be necessary to lay greater emphasis on quick yielding production schemes and ancillary industries rather than on programmes of a long-term nature.

It was gratifying, he said, that preliminary surveys had been completed last year in some of the Major Ports and in a large number of selected minor ports. Plans and estimates for major ports of Madras, Tuticorin and Mangalore were ready and those for Bombay and Cochin were likely to be ready soon.

Early Completion of Fishing Harbours

He urged that work of fishing harbours be initiated early and completed in two or three years so that more mechanised fishing vessels and trawlers that were to be introduced would have proper facilities for landing and for processing and distribution of catch. Such

facilities would enable efficient handling so that distribution and processing could be on an industrial scale leading to reduced production costs.

Indigenous Manufacture of Marine Engines

To meet the increasing tempo of mechanisation and introduction of larger vessels, the indigenous manufacturers of marine diesel engines had been stepping up their capacity for delivery and for undertaking large scale servicing facilities. Those efforts would have to be increased further to meet the new objectives. Since indigenous ship builders were now taking interest in building fishing boats, Government were taking steps to place orders with Indian firms for boats of proven design.

For exploratory programmes, it was necessary to import two or three prototype of exploratory fishing boats which had been found suitable by the Fisheries Technical Mission for operation in Indian waters. The designs would be finalised after gaining experience from exploration so that further construction of such boats could be taken up for commercial operation.

Regarding the requirements of fishery equipment from indigenous sources and the possibility of obtaining the balance from abroad, Shri Subramaniam urged the need to streamline the productive activities and procedures by advance planning. Such streamlining would assist in maintaining the tempo of activity.

Training facilities not fully utilised

Additional units for training for fishermen in operation of small mechanised fishing boats were established in some States. The Central Institute of Fisheries Operatives had also introduced more courses and was taking up a new centre in Madras this year and one in Gujarat next year. To provide training at different levels,

Government were laying great emphasis on the training programmes undertaken by the Central Institute of Fisheries Education, the Central Institute of Fisheries Operatives and the proposed Regional Fisheries Training Centre of inland operatives and State Fisheries Training Centres.

He urged the State Governments to do some advance planning so that sufficient number of trained people at various levels were available in accordance with the anticipated requirements of production programmes and production units. This was necessary so that fishing vessels were put to use immediately these were constructed.

Shri Subramaniam said that the training facilities were not being fully utilised; he even felt that there was negligence in getting the men trained properly. He urged the State Governments to make better use of training facilities.

Government Assistance for Credit and Finance

Fishing industry, Shri Subramaniam continued, was one of these where Government or quasi-Government bodies were the main source of finance and credit. This was so in most developed countries. It was all the more important that in a developing country like India, fishing industry should get these facilities. Financial assistance in the form of grants and subsidies was proposed to be given by Government for fishing vessels and other equipment, processing plants, transport etc.

Duty on Diesel Oil

Shri Subramaniam appreciated that the incidence of duty on Diesel Oil for modern engines required for fishing was high. The question of relief on Diesel Oil had been taken up and certain amount of relief had been extended for small fishing vessels. Government were now considering the question of providing such relief for larger fishing vessels also.

Institutional Finance

Credit assistance would be available to ancillary industries to some extent through the industrial finance corporation and the agriculture Refinance Corporation. But it had to be admitted that institutional finance particularly for the progressing units was not now available to the desired extent. Non-availability of institutional finance was due to the structure of the existing rules of the Reserve Bank of India. The Central and State Governments had, however, a few schemes for financing such fisheries projects as did not attract institutional finance, Shri Subramaniam said and added that it was necessary to continue such financial assistance till the time institutional finance became available.

Regarding to the activities of the Central Fisheries Corporation and the State Fisheries Corporations which had been set up in some States as well as the apex co-operatives or federations which had been set up by some other States, Shri Subramaniam said that their activities should be complementary to each other. Since finance was provided by the State and Central Governments, it was equally the responsibility of the State Governments to fully back such State and Central Fisheries Corporations to achieve the ends for which these had been set up. For instance, with the development of Reservoir Fisheries, it should be possible to lay down a policy that fish from Reservoirs and Irrigation tanks was supplied through co-operatives, State Corporations or Central Corporation on an accepted system so that the fishermen could reap full benefits and at the same time the consumer could get fish at a reasonable price without middlemen exploiting either the producer or the consumer.

Since State and Central Governments played an important part in organising the integrated fisheries development programmes, it was extremely important the Government services were staffed and equipped to fulfil this responsibility. There was, therefore, great need for

effective Government organisation, and efficient administration system and imaginative procedural device. He had no doubt that if important production schemes were implemented on a priority basis resulting in increased fish production and export, it should not be difficult to find additional finance for increasing these activities. He therefore urged the State Governments to give sufficient priority to production schemes and to essential services required for additional fish production.

Shri Subramaniam emphasised the importance of fish wealth, both as a supplementary food for the people and as a potential foreign exchange earner. Fish production, he said, called for determined efforts in several directions. It involved expansion not only of infra-structure facilities such as communications, storage and transport, but also the establishment of various inter-related industries and services such as development of harbours, building of fishing vessels, manufacture of equipment for inshore and off-shore fishing and an integrated programme of processing, distribution and marketing. This involved long-term planning with a perspective of planned development of different sectors.

Earlier, welcoming the members of the Board, Shri G. Bhuvarahan, Minister of Information and Publicity, Madras, made a plea for greater attention being paid to the development of fisheries. He pleaded especially for provision of larger vessels for deep-sea fishing.

The Madras State Fisheries Department, he said, was the oldest in the country, being constituted in April 1907. It had developed numerous resources and facilities including eleven marine, inland and technological research units, three inshore fishing centres, one staff training institute, three boat building yards, five service centres, about 500 mechanised fishing boats, several departmental farms and spawning and cultural centres, fish-curing yards, ice plants and cold storages, canning factory and fish

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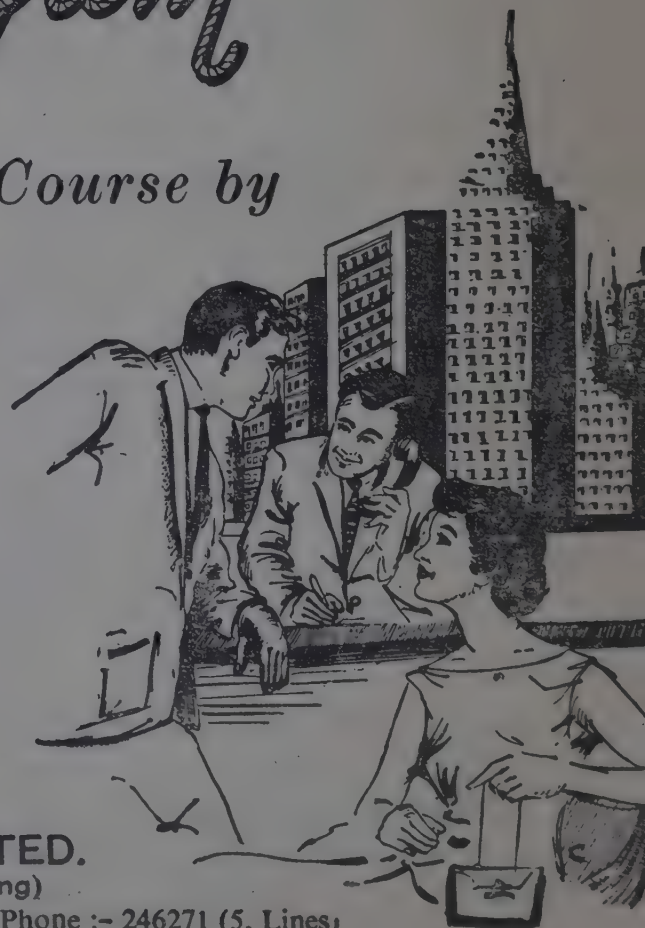
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distribution vehicles. About 400 fishermen cooperative societies and unions were functioning. He also referred to the Indo-Norwegian Project at Mandapam. The annual fish production had increased from 78,000 tonnes in 1950-51 to 2,52,000 tonnes in 1965-66.

As a source of food, fishery was almost at par with animal husbandry for providing the animal protein requirements, he said. But there was at present a great gulf between production and consumption requirements based on considerations of nutrition. To meet the growing requirements of a rapidly increasing population, exploitation and utilisation of the fisheries resources must be given serious attention by the Central and State Governments.

"So far our efforts for increasing fish production from the sea have been confined to the coastal area", Shri Bhuvarahan continued. Though some exploratory fishing with a few medium-sized vessels is conducted by the Central Government, Deep-sea fishing worth the name has not been organised. The Arabian sea, Bay of Bengal and the Indian Ocean abound in oceanic fisheries. There was also deep sea fishing grounds like the extensive wadge bank and pedro bank which have not been exploited systematically. Want of larger vessels like trawlers, tuna boats, factory and mother ships is the primary factor for non-development of

deep sea fishing. It is essential that the Centre procures these vessels and assists the States in organising deep sea fishing."

He emphasised the need for fishing harbours for berthing and sheltering fishing boats and vessels which were necessary to the success of deep sea fishing. Madras State was at a greater disadvantage owing to its heavily surf-beater coast and sand bars at the river mouths, and the susceptibility of the coast to north-east monsoon, periodical cyclones and tidal waves.

50 Trawlers recommended

The board during its 2 day deliberations made a number of recommendations with a view to stepping up the tempo of the Fisheries Development in the country. The recommendations among other things included building of 25 large fishing vessels for deep-sea fishing within the country. The board also recommended the importation of 25 such vessels from Sweden under credit agreement with that country.

The board also agreed with the proposal for establishing 3 more units for training in Fisheries Operatives two on the East Coast and one on the West Coast. The board also set up a committee to study the question of staff training courses and suggest measures for ensuring useful and effective training at various levels.

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CONTAINERS FOR TRANSPORT OF FISH

N. P. DANI & B. L. AMLA
(Central Food Technological Institute, Mysore-2)

Introduction

The *per capita* catch of fish in India is very low—2.25 kg./annum. Only 47.9 per cent of the total fish landings enter the market as fresh fish and the bulk of the catch is consumed in coastal regions. On account of inadequate facilities for storage, transport and distribution, the pattern of utilisation of fish has remained more or less unchanged over a period of years. In spite of low *per capita* catch, there is an excess supply of fish in the coastal regions during fishing season whereas inland areas go hungry for fish. This brings about a few evil consequences—(a) fishermen do not get proper price for their catch; (b) no incentive to increase the catch

of fish; and (c) wastage of fish when there is demand elsewhere.

Proper utilisation of the present fish catch is as important as catching more. In under-developed countries, increased utilisation of fresh fish should be considered of greater importance than costlier and capital intensive methods of preservation like canning and freezing.

In U. K., 60-70 per cent of fish reaches the consumer packed in ice. This has been made possible through use of improved containers and refrigeration facilities. The trend in utilisation of fish in some leading countries is given in Table I.

TABLE I. Utilization of fish catch in selected countries (1960)

Countries	Total catch in '000 metric tons	Fish catch per capita kg. per year	Per cent Utilization					
			Fresh	Freezing	Curing	Canning	Reduction	Miscellaneous
Japan	... 6192.5	66.2	22.6	12.8	43.6	6.7	13.9	0.4
Peru	... 3501.4	325.3	2.3	0.5	0.6	1.9	97.7	...
U. S. S. R.	... 3500	14.2	15.5	30.5	30.2	11.8	10.8	0.1
U. S. A.	... 2796.9	*15.6	30.0	11.2	1.3	28.8	34.4	0.2
Norway	... 1598.9	445.7	10.8	9.7	26.8	3.0	48.8	0.1
India	... 1159.9	2.5	47.9	...	43.7	...	8.4	...
U. K.	... 1076.6	17.5	79.8	11.2	2.6	0.9	3.0	2.4
Canada	... 915.2	51.3	20.6	29.9	30.8	7.2	9.3	2.4
S. Africa	... 465.8	36.6	19.8	6.1	15.5	11.6	46.8	0.2
Spain	... 836.7	31.0	65.9	...	18.9	12.4	2.8	...
World	... 37,700	12.6	40.0	9.0	19.0	9.0	20.0	3.0

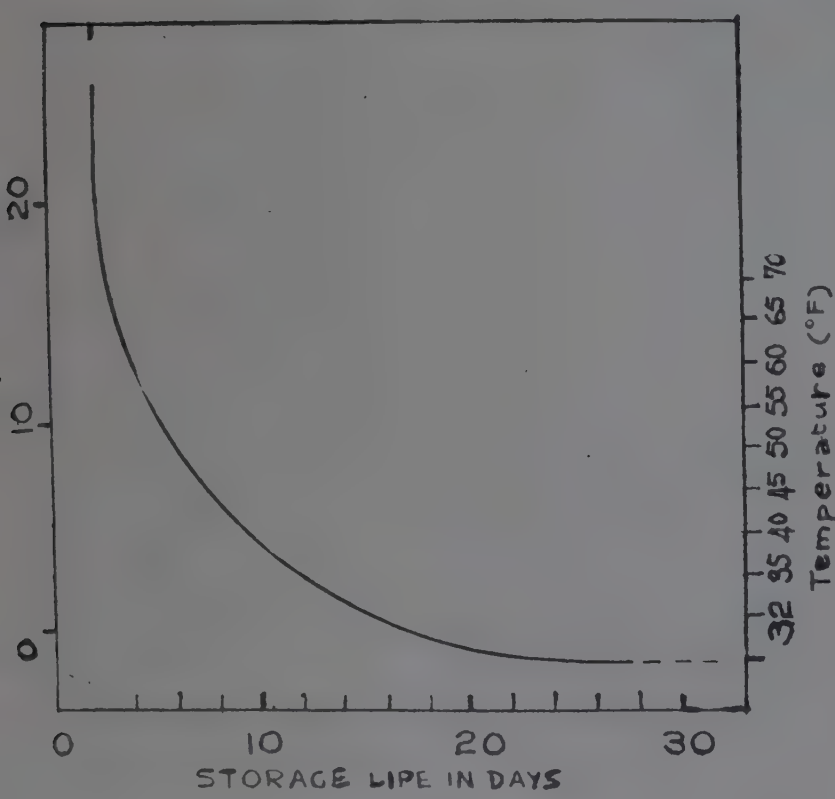
Data collected from *Fish as Food*, Vol. II, Ed. G. Borgstrom (1962)

* Calculated

Improvement in the utilisation of fish in fresh form will involve development of better techniques of handling and preservation which will increase the supply of fish to the consumer significantly. The practical way to preserve the fish in prime condition for a limited period is to store in ice. The lower the temperature the longer the storage life, but with ice a temperature below 32°F is not attainable.

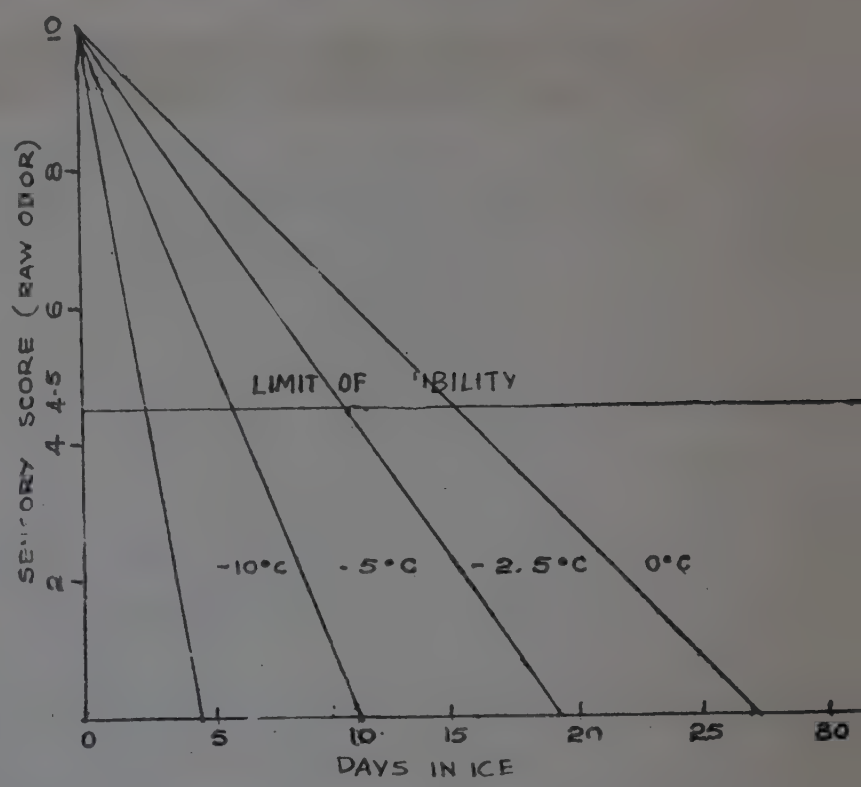
Time-temperature Relationship: It has long been realised that freshness of fish depends primarily on its temperature and the time that has lapsed since its catch. Higher the temperature, faster the bacterial growth in the fish thereby producing unpleasant by-products. The initial bacterial load and the nature of contamination play a vital role in the deterioration of fish.

FIG. 1
Change in storage life of cod with change in temperature (a)



Note that slight lowering of temperature below 0°C (32°F) greatly increases storage life as judged by chemical and taste-panel methods of assessment.
 Ref: "Developments in handling and processing fish" by G. H. O. Burgess, p. 28 published by Fishing News (Books) Ltd. London.

FIG. 2
Change in storage life of cod with change in temperature (b)



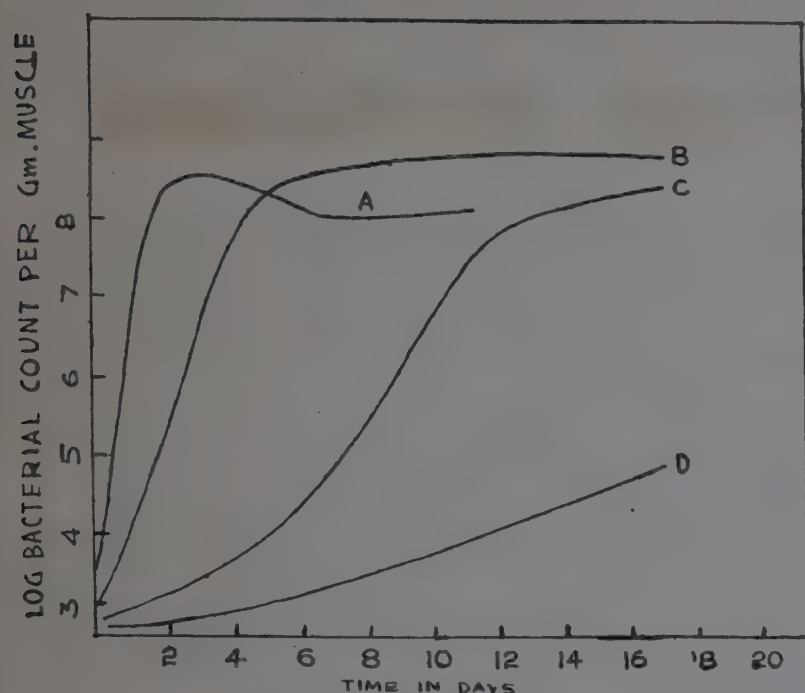
Ref: Lectures given to students of "Fish Handling and Processing Course" in the year 1962 organised by Torry Research Station, United Kingdom.

Investigations carried out at Torry Research Station, U. K., with the fishes of British Isles, indicate that the spoilage rate measured organoleptically, chemically and bacteriologically, increases at constant rate with temperature between -1°C and 25°C. For example fish which may remain in an edible condition for 16 days at 0°C would remain good for 21½ days at -1°C but only for 10½ days at +1°C. The storage life of cod with change in temperature is given in Fig. 1 & 2. The effect of temperature on bacterial growth is given in Fig. 3. Though the data as such may not be wholly applicable for fish caught in other regions, they indicate a trend which is likely to occur with other fish.

Preservation of Fish with Ice: The problems associated with the ice preservation of fish are (a) non-availability of ice at reasonable price, (b) lack of adequate refrigerated storage facilities at important landing places, (c) inefficiently developed transport net work between landing

FIG. 3

The effect of temperature on bacterial growth



Ref: "The microbiology of sea-water fish" by J. M. Shewan published in the book "Fish as food", Vol. I by G. Borgstrom, Academic Press, New York, 1961, page 503.

centres and the markets, and (d) lack of suitably insulated containers for transport and distribution.

The first three problems are being gradually looked into all over the country. However, on account of high initial capital investment and shortage of foreign exchange, the measures have not been very effective.

In this paper, efforts are made to analyse problems associated with the development of suitable containers for transport and distribution of fish. A right type of container will go long way to make best use of ice used for holding fish. In India, with its hot and humid tropical climate, suitably insulated containers are needed to keep fish at a low temperature with ice.

The Requirements of Fish Containers: The most important requirements are (1) size of container suitable for the type of fish to be packed, (2) easy handling under operating conditions of transport, (3) durability, (4) the resistance to stress and strain in transport, (5)

insulation to prevent excessive melting of ice, and (6) prevention of leakage of drip water. In designing and fabricating a durable container cleanability, sanitariness and wear and tear are the chief considerations; for disposable containers, price will be the determining factor.

Containers in use in India: The types of containers used in different parts of the country vary. However, they consist mainly of two types: (i) bamboo baskets, and (ii) wooden boxes. Metallic containers made of aluminium and galvanised iron are used for special purposes only. There is no standard size for bamboo baskets. Their capacity ranges from 4.5 to 45 kg. of fish and they can be re-used 2-3 times. The wooden boxes also do not conform to any standard size. They are made from locally available wood and being sturdier than bamboo baskets are re-usable for longer time. Empty tea-chests made of plywood are used in certain parts of the country. They seem to have better insulation than ordinary wooden boxes. However, they are not specially designed and manufactured for fish transport. The bamboo baskets and wooden boxes have number of disadvantages like poor insulation, less durability, unsanitariness and pilferage during transport.

No systematic attempt has been made to collect data on the estimated loss of fish on account of defective packaging under various conditions of handling and transport. Some useful idea can be obtained from the available information in the literature dealing with the storage of fish in ice under different conditions. However, it should be noted that the data from one set of experiments carried out with one or two species of fish and under certain specific conditions may not be generally applicable to another set of conditions.

In the experiment carried out at Central Institute of Fisheries Technology, the sardines and few fish packed in bamboo baskets (un-insulated) with ice in the ratio 1:1 by weight were found unacceptable after 18 hours. Work

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carried out in C.F.T.R.I. Station at Mangalore has shown that even precooled fish (sardines, carps) when packed in ice (1:1 ratio) in un-insulated bamboo basket could not be maintained in edible condition beyond 14 hours while in insulated baskets the fish was found edible at the end of 16 hours. It is also observed by workers at C.I.F.T. at Veravel Station that when pomfrets were packed in ice in plywood box (un-insulated), ice melted within 20–24 hours.

Development of new Containers: In recent years in Western countries besides wooden and aluminium containers plastic fish boxes have also been designed. They are used most extensively in U. S. A. and in several European countries like U. K., France, Germany, Norway, Denmark, Italy and Portugal for handling and shipment of fresh and frozen fish. These new plastic fish boxes are made of high density polyethylene, polysterene and P. V. C. and have several advantages over traditional wooden boxes, or metallic containers. They are light-weight, non-absorbant, sanitary, corrosion-resistant, stackable and easy to maintain.

High density polyethylene fish boxes are manufactured by injection moulding process and have already become popular in U.S A. Its low thermal conductivity delays the melting of ice and maintains fish at low temperature during transport. Special drain holes at the bottom ensure drainage of drip water. The use of wooden and aluminium containers are also being discarded in East Germany and polysterene material is being introduced for fabricating containers for transport of meat and fish. In France, high density polyethylene containers have substituted returnable wooden cases at important fishing ports. The design allows for stacking during loading and for nesting when empty. This feature is very convenient for fish trade as it offers space economy and easy handling.

The disposable corrugated fibreboard containers are being designed by various firms for

carrying seafood. They are either wax impregnated or poly-lined or P. V. C. coated to make them water-proof. Poly-lined or resin impregnated kraft paper is recently used as liner for fibreboard fish boxes. The polyethylene lined cartons do not crack when the board is creased on forming. They also possess superior grease resistance and are unaffected by freezing temperatures. These developments in the container manufacturing have a definite place in advanced countries, but in countries like India, these new containers have to be produced at a price that will compete with the low cost of the containers currently in use.

Scope of Improvements in the Traditional Containers: Under the circumstances it appears advisable to direct more efforts to bring about improvements in the traditional containers.

1. *Insulation:* Attempts have been made to insulate the traditional containers by using (1) thermocole, (2) polyethylene lined gunny cloth and (3) bitumen lined kraft paper. The plywood boxes (18" × 18" × 28") were insulated with polyethylene wrapped $\frac{3}{4}$ " thermocole board. The trial conducted with these improved containers showed a three-fold increase in the storage period. The insulation boards can be re-used 4–8 times. Central Institute of Fisheries Technology has developed thermal insulating boards from coconut pith for fishing trade. In view of low cost and comparable physical characteristics with other insulating materials, its use has been claimed to be promising.

Rate of melting of ice can be considerably reduced by introducing suitable insulation liners in the baskets used extensively for transport of fish in the country. This does not introduce change in size, shape or the carrying capacity of the containers. The relative time taken for fish packed in ice (1:1 ratio) to raise the temperature to 41°C is indicated in Table II.

TABLE II. *Relative efficiency of liners for bamboo baskets*

Type of insulation	Period in which the content rise to 41°C temperature
1. Without any lining	... 9 hours
2. With 300 gauge polythene lining ... ..	... 11 hours
3. With Bitumen coated Kraft-paper ...	... 15 hours
4. With gunny lined with polythene (300 gauge)	... 17-18 hours

From the Table II, it is clear that the polyethylene laminated gunny cloth has decided advantages but it also suffers from certain drawbacks, such as getting wet easily and losing insulation characteristics. A new bamboo container with poly-lined gunny as insulator devised at CFTRI has proved more efficient in this respect. The container consists of an outer bamboo basket separated from an inner basket by polyfilm lined gunny. Polyfilm inside the inner basket would prevent the wetting of the liner. All these insulating materials have limited use in the transportation of fish. They cannot be used successfully for hauling the fish over long distances.

2. *Reusability*: In India the fishing season lasts for 100-120 days in a year. Any container meant for re-use should last for the entire season which may mean 10-12 trips. The bamboo and wooden container presently in use do not last for more than two or three trips. Increasing the reusability of wooden container to 6 trips or above would bring down the cost of transportation considerably. The savings thus effected can pay for better insulation and making the container more durable. Metallic container made of aluminium or corrosion-resistant aluminium alloy have the advantages of being light-weight, more durable, sanitary and easy to handle. They are used exclusively in freezing

plants, cold storage and refrigerated transport. Their extensive use in India is not likely at present as the initial cost is several times that of the cheapest containers available.

3. *Cleanability*: When bamboo or wooden containers are re-used, they get heavily contaminated with bacteria. The disadvantage of a wooden box is that being porous, it harbours dirt, and bacteria which cannot be removed by washing or scrubbing and act as a source of further contamination of fish. The bacterial contents of new and used fish boxes were determined and the results indicated that the bacterial content of a box increased by over million times when used once. The investigations showed that practice of cleaning the boxes with cold water without sanitizers and drying in the sun was not very effective. Even hosing with water and subsequent steaming does not appreciably reduce the bacterial load on the surface of the container. The older wooden boxes are difficult to clean even with prolonged steaming. When initial bacterial load is very high, even 99 per cent reduction by the use of disinfectant still leaves considerable bacterial load. In U.K., D.S.I.R. has recommended use of a non-returnable (38.1 kg. capacity) wooden box which is not only sanitary but also the cheapest container available. Frequent causes of damage have been minimised by strapping the boxes with steel and using suitable fasteners in the construction of the box.

The problems of keeping fish containers hygienically clean under commercial conditions is complicated by repeated heavy contamination and continual use. It is impossible to effect complete elimination of bacterial organisms under operating conditions. In many areas, wooden fish boxes have been improved by spraying the inside with plastic coating. The plastic coated wooden boxes could be cleaned as they are less liable to spoilage and the bacterial contamination could be reduced to one-tenth. Use of disinfectant and scrubbing the surfaces reduce the bacterial load. Hypochlorite solution containing 1000 p.p.m. free

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chlorine and quarternary ammonium compound, 0.1 to 1 per cent strength—are most effective sanitizers available. Hypochlorite is cheapest and best for application in food industries. In U. K. and Germany, fully automatic washing machines are installed at important fishing ports. Such plants handle from 4000 boxes per 8 hours (U.K.) to 8000 boxes per 8 hours (Germany).

4. *Quantity of Ice*: For packing fish in containers sufficient quantity of ice should be used to bring down the temperature to 0°C. The accumulated blood and slime should be allowed to drip. One kg. of ice absorbs 80 Kcal heat to melt to water at 0°C. Assuming specific heat of fish at 0.9 and that no external heat is absorbed, approximately 2 kg. of ice is required to bring down the temperature of 8 kg. of fish from 22°C to 0°C. Thus the ratio between weight of ice to fish is 1:4. Keeping in view heat absorption due to improper insulation and high ambient temperatures, the ratio of ice to fish has to be increased to 1:1. Under tropical conditions the ratio of 1½ parts of ice to 1 of fish is suggested for long distance transport. The quantity is reduced when fish is transported in refrigerated vans. The ice should not be spread uniformly throughout the pack. It is recommended to place 1/3 of the total quantity of ice at the bottom, 1/3 in between layers and remaining 1/3 on top.

5. *Pilferage*: In long distance transport through railways, the containers are used without lids. Sometimes, they are covered with gunny cloth and tied with coir. The possibilities of pilferage in such type of containers and with present mode of packing are generally high. No data is available on containers lost or damaged during journey and containers becoming unserviceable on return.

Conclusion: It is unlikely that there will ever be a single best design of container, as the conditions under which containers are used vary considerably. Any programme for the popularisation of improved containers will not only take

into account the need for a new container design but also its economic feasibility. However sound the technical reasons may be for a change, the commercial feasibility would be the deciding factor.

Before undertaking a programme for container design and manufacture it is necessary to have data on the estimated loss to the trade on account of (i) temperatures maintained during different stages of assembling and transport of fish, (ii) containers lost or damaged during journey and (iii) container becoming unserviceable on return. The high price of containers made out of metal, plastic or paperboard limits their immediate introduction into the fish trade; therefore it would be necessary to improve the bamboo basket and wooden boxes for an immediate relief to the industry.

In order to bring in improvement in these containers it is necessary to look for (1) an inexpensive disposable insulation liner for bamboo baskets and (2) to make the wooden containers better insulated, durable and sanitary.

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Extraction of Sardine Oil

SARDINE oil extracted by the existing commercial practice is generally of inferior quality when judged by its chemical characteristics, low storage life, undesirable colour and objectionable odour. During the fishing season many oil extraction units spring up all along the coast, but most of these would not be equipped to carry out the extraction on a scientific basis. Perhaps the very limited use of sardine oil must be responsible for this lack of interest on the part of the industry in adopting scientific methods. Because of the very same reason it was often noticed, during peak sardine fishing seasons, that considerable quantities of fish are used as manure as such, without recovering the valuable oil.

Oil sardines constitute nearly 20% of the total marine fish landings in India, the average annual catch being of the order of 132,000 tons. The catch during the past five years was as follows:

Year	Quantity of oil sardines landed (in metric tons)
1961	167,883.98
1962	110,299.38
1963	63,646.91
1964	274,333.00
1965	42,693.00

Assuming that about 50% of the total catch would be available for extraction of oil the quantity that could be produced works out to

about 6500 metric tons per year on the basis of an average oil content of 10% in the fish. But the quantity produced at present is much less.

This Institute took up investigations on the problem of sardine oil extraction as a part of the programme for working out new or modifying existing methods for the better utilization of marine byproducts. The first attempt was to develop a method for the extraction of the oil at very little extra cost in a high state of purity. As a result of this effort a method was evolved which was found, on elaborate trials under field conditions, to produce a good quality product. In brief the method is as follows:

Method of extraction of sardine oil:

1. As far as possible use only fresh sardines for the oil extraction. Wash the material well.
2. Take water in the vessel used for extraction in the ratio of 1 part of water to 1 part of fish (by weight). Boil the water. (Aluminium or tinned copper vessels are suitable for extraction of the oil).
3. Add the material to the boiling water and continue the boiling till the oil gets separated at the top. Stir occasionally while boiling.

4. Collect the separated oil by means of spoons or trays. Keep the oil.
5. Cook again for about 30 minutes with occasional stirring. Allow to settle. Collect the supernatant liquid and keep it.
6. Take the cooked material in canvas bag, press under a screw press and collect the press liquor. Mix the press liquor with the supernatant liquid collected before.
7. Add sufficient quantity of common-salt to the oil water mixture to break the emulsion. Collect the separated oil and mix with the sample of oil collected earlier.
8. Heat the oil on a water bath to remove the last traces of water.
9. Store suitable lots in containers.

The characteristics of the oil extracted by the improved method are given below. For comparison, the characteristics of samples of commercially available oil are also given.

Analysis data on sardine oil

	Oil prepared by the improved method	Commercially available oil
<i>Physical characteristics:</i>		
Colour	Lemon yellow to yellow	Yellow to black
Clarity at room temperature	Clear	Turbid to clear
Odour	Characteristic of the oil	Rancid odour

Chemical characteristics:

Saponification value	192-195	192-198
Iodine value	152-175	139-161
Peroxide value	0.32-2.7	0.4382-7.2
Unsaponifiable matter	0.83-1.15	0.84-1.55

The oil prepared by the improved method besides having marked increase in quality in many ways, keeps well for one year (or even more) without significant changes in the analytical characteristics. This is important since any industry that may utilize the oil will require a constant supply. Since the extraction is seasonal a constant supply can be ensured only if the oil can be kept in good condition at least till the ensuing fishing season.

— From Fish Technology News Letter.
Published by The Central Institute of
Fisheries Technology.

U. S. Shrimp Imports Continue to Increase

According to the following figures from the U. S. Bureau of Commercial Fisheries, shrimp imports for the period January–September 1966 are approximately 5½ million pounds ahead of the same period last year in spite of the fact that Venezuelan imports were down nearly 10 million pounds due to severe drought conditions:

Shrimp, all types	September		January–September		Total
	1966	1965	1966	1965	1965
(in thousands of lbs)					
Mexico	4,396	3,704	38,200	35,221	59,936
Guatemala	180	148	1,780	1,156	1,516
El Salvador	611	524	4,371	3,508	5,376
Panama	968	839	7,579	8,086	10,266
Colombia	222	324	1,640	1,376	1,796
Venezuela	158	480	2,167	11,999	12,720
Guyana	711	493	6,575	5,901	7,972
Ecuador	458	802	4,079	4,129	5,665
India	2,443	1,464	12,749	10,084	14,275
Pakistan	398	566	5,042	4,062	6,566
Japan	344	186	2,131	1,722	2,505
United Arab Republic	58	12	223	417	475
French Guiana	348	*	3,225	*	3,960
Russia	274	*	783	*	*
Iran	734	*	6,479	*	6,801
Kuwait	456	*	3,178	*	*
All other countries	2,219	2,706†	17,687	24,433†	23,259‡
Total	14,798	12,248	117,888	112,094	163,088

* Figures not available

† French Guiana, Russia, Iran, Kuwait included

‡ Russia and Kuwait included

(Shrimp abstracts, International Shrimp Council)

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NEWS and NOTES

Marine Council Chairman to attend the International Shrimp Council meeting in U. S. A.

Shri V. M. Srikumaran Nayar, Chairman of the Marine Products Export Promotion Council, is scheduled to visit U. S. A. to attend the meeting of the Board of Directors of the International Shrimp Council due to take place at New Orleans, during the second week of November.

ISEA appeals for Cash Incentives to Seafood Exports.

The Indian Seafood Exporters Association in a communication sent to the Minister for Commerce, Government of India, have requested to bring the Seafood Exports under the Cash Incentive scheme.

Protein from Fish

A Swedish drug company has perfected a system of extracting protein from fish – a major step forward in meeting the world's food shortage, it is reported. The company, AB Astra, according to reports, claimed that it could produce 40 tonnes of protein concentrate per day at its new factory, the only one of its kind in the world. The new process produces a white powder from which the smell of fish has been removed and which can be used to enrich such everyday foods as bread, rice pancakes, sauces and soups. The company's research chief

is reported to have said that it would be first used on animals and later introduced into the main food of needy countries.

200 Trawlers during Fourth Plan.

It is proposed to acquire 200 Trawlers, construct 8000 machanised boats and increase the output of other ancillary equipment for off-shore and deep sea fishing, during the fourth plan period according to the revised draft of the Plan. Production of fish is expected to increase from 11.5 lakh tonnes in 1965-66 to 15.3 lakh tonnes in 1970-71.

Trawlers from Yugoslavia.

Arrangements are being made to get five trawlers from Yugoslavia, very soon, it is reported.

Burma Decontrols Marine Products.

Burma recently decontrolled 11 items of Marine Products among the 34 food items. Trading in these items is now open to private traders and co-operatives.

Fish Oil Hydrogenation Plant in Kerala

A fish oil hydrogenation plant would be set up in the State-owned Kerala Soaps and Oils Factory at Calicut, during the Fourth Plan. The Rs. 15 lakhs plant, according to its

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General Manager, would refine and hydrogenate sardine oil for the manufacture of soap in the factory. Hydrogenated sardine oil could be used for edible purposes besides manufacture of fatty acids and could be, therefore, a big foreign exchange earner, it is reported.

Mexico Expanding Shrimp Fleet*

Mexico, largest exporter of shrimp to the United States, is planning to double its present shrimp Fleet to more than 1,000 vessels, many of them sonar-equipped. Plans to operate in international waters wherever shrimp may be found were disclosed following the signing of a 3-year contract between fishing cooperatives and vessel owners. Leaders estimated the shrimp take will be worth at least (U. S.) \$ 200 million. Most of the catch will be exported, principally in frozen form to the United States.

Reversing the usual trend of U. S. vessels off the Mexican coast, at least 28 Mexican shrimp vessels were operating in international waters off the Texas coast as of mid-September 1966.

Japanese Report Good Shrimp Fishing off Australia*

Japanese vessels licensed to fish on an experimental basis for shrimp off Australia commenced exploratory fishing June 15. Initial tests were only fair, but late in June one vessel reported to be averaging daily catches of nearly 700 pounds of quality shrimp. As a result, it was anticipated that the company would dispatch additional vessels to the Gulf of Carpentaria shortly.

Space Vehicles May Help Increase Catch of Fish*

In a speech on October 5 before the Atlantic States Marine Fisheries Commission, Under Secretary of the Interior Charles F. Luce stated that space vehicles may help increase the catch of fish from the oceans. Mr. Luce said American astronauts have been briefed on fishery and oceanographic research and "they have already supplied us with much useful information." He predicted that the total consumption of commercial fish and fishery products in the United States, both from domestic and imported sources, will jump to nearly 28 billion pounds a year by the year 2000. The present consumption is approximately 12 billion pounds.

U. S. Enacts 12-Mile Fishery Zone*

On October 14 the President of the United States signed into law an Act establishing a 9-mile contiguous fisheries zone beyond the 3-mile territorial sea, extending U. S. fisheries jurisdiction to 12 miles.

Plans Announced for new Aluminum Fishing Vessel*

The Aluminum Association in the United States recently announced plans for an aluminum trawler convertible to 5 uses. With only slight modification the new aluminum vessel can be used as double-rigged shrimp trawler, a stern-fishing trawler, a tuna long-liner, a purse seiner, or a pocket-size factory ship. It is understood the Aluminum Association will make plans available at a fee of \$ 250 per vessel built.

* Shrimp Abstracts
International Shrimp Council.

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Shri P. K. Dewar, Director, Travancore
Cochin Prawn Curers' Co-op. Marketing Society
Ltd., (A member of the ISEA) was recently
elected to the committee of Administration of
the Marine Products Export Promotion Council.

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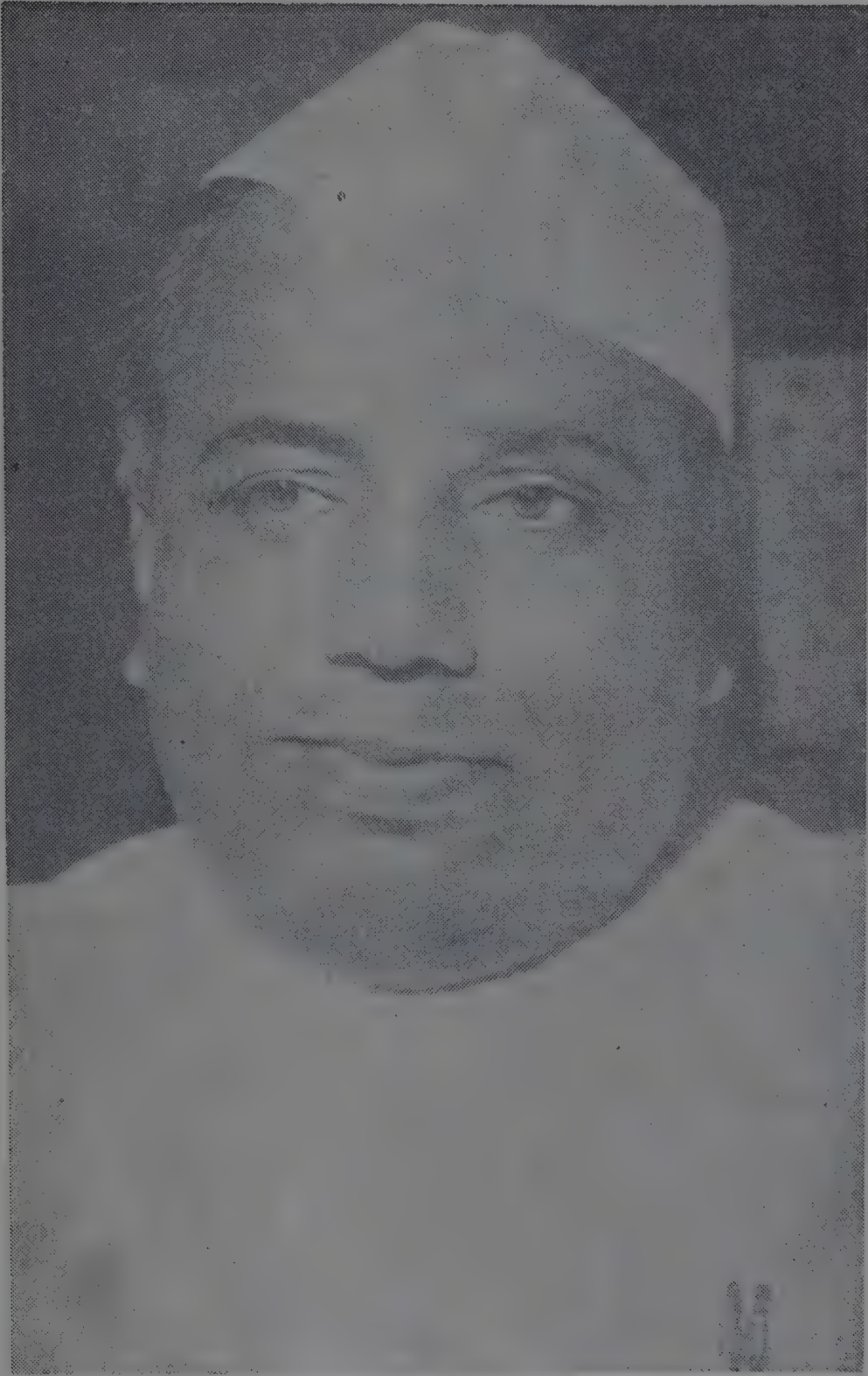
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Editorial

ACCORDING to the Draft Fourth Plan it is proposed to acquire 200 Trawlers and 8000 Mechanised Fishing boats during the current plan period. The Central Fishery Board at its recent meeting has recommended the construction of 25 trawlers within the country and importation of further 25 from Sweden. It is indeed gratifying to note that Government have, though belatedly, recognised some of the needs of the industry as put forward by it from time to time. The demand for trawlers to increase the catches was of course one of them. While we have no hesitation in saying that two hundred trawlers would fall far short of the industry's urgent requirements, we are happy at any rate that a beginning is being made. That in itself, we feel, is a step forward and should go a long way in helping the industry to appreciably increase its exports.

We take this opportunity of congratulating the Government and the Planning Commission on their proposal as above with a view to substantially increasing production. However, we must express our apprehension that acquisition of Trawlers alone cannot take the industry far or yield the desired results. Care must be taken to ensure that the trawlers and mechanised boats so acquired are put to timely and proper use. As far as can be judged it is not clear how the Government propose to utilise the trawlers and mechanised boats. Utilisation being more important than mere acquisition, this important aspect has to be considered and decided upon.

It may not be out of place for us to underline the pioneering zeal and valuable contribution made by the private sector in starting and bringing the industry to the position it now enjoys. Starting from

scratch and facing odds not to speak of heavy risks it took it was the private sector which made the industry what it is today. Yet it is a sorry spectacle to find that the Government is apparently in no mood to recognise this important factor. At a time when the Government is planning to provide a large number of trawlers and mechanised boats, the Indian Seafood Exporters Association would invite Government's attention to the vital role continued to be played by the private sector in the upkeep and progress of the industry. It would, therefore, be but meet and proper for it to demand that a fair share, if not the entire number, of the trawlers be allotted to the private sector to enable it to exploit the oceanwealth. All these years, it has had to contend with outmoded equipments and extreme limitations. Now that a realistic plan is under way, the handicaps suffered so long by the private sector must be removed.

Lack of resources, it must be remembered, played havoc with the private sector's ambitious plans to bring more and more underwater wealth to the shores by importing and utilising deep-sea fishing trawlers. Time and again we have pleaded for assistance by way of loans and subsidies to the industry. At a time when proposlas are afoot for acquisition of trawlers and mechanised boats, we wish to renew our request that a substantial number of these is made available to it at subsidised rates with easy payment facilities. By so doing the Government will not only be fulfilling its obligations to the private sector but also helping it at a time when the impact of shortage of raw products is acutely felt.

May we express the hope that the Government will rise to the occasion and extend its helping hand to the industry which can be relied upon to reciprocate through increased catches and foreign exchange earnings for the Country ?.

SYMPOSIUM ON THE SCIENTIFIC AND TECHNOLOGICAL PROBLEMS IN COASTAL AND NEARSHORE OCEANOGRAPHY

INAUGURAL ADDRESS

Dr. K. L. RAO,
*Union Minister of State
for Irrigation and Power*



IT gives me great pleasure to be in your midst when you have gathered to discuss various Scientific and Technological problems in near-shore Oceanography. I am grateful to Shri Atma Ram, Director General of C. S. I. R. for extending his invitation to me so that I can have an opportunity to acquaint myself with the important topics you are going to discuss at this Symposium.

IMPORTANCE OF 'SEA' STUDY

The subject on which we in India are most ignorant is about the oceans though our ancestors used it extensively for travelling to various parts of the world. I am afraid, I should say that we know less of it than our past generation.

Long before the man appeared on the earth, rivers and sea were formed and today sea occupies 70% of the earth's surface. There is a continual inroad even on the remaining solid

earth, for rivers erode and carry the soil on to the sea and the sea through the wave action itself relentlessly attacks the vast two lakh mile coastal line of the world. The battle between sea and land started in the ancient past. Further due to continual excess unutilised flow in rivers and other unknown factors, the sea is stated to be rising continually about 6 inches to 2 ft. in 100 years and will therefore in a distant future occupy more of land space. It is anticipated that the sea in the past was 500 ft. below the present level. It is calculated that if sea and earth are levelled and brought to a uniform level as it existed in the beginning, the water in the sea is so much that it will cover the entire world's surface by 300 ft. Thus the invasion of sea presents a real problem to the multiplying human race and the way to overcome and control the sea is to know the mysteries of sea and wrest the secrets from her. Science offers the necessary technique for this.

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In undertaking these scientific investigations, India has an obligation, for, it is the tenth among the nations of the world in the extent of its coast line. With its 3500 miles of coast, most of which is sandy except for 500 miles of rocky beaches in Maharashtra, there are vast opportunities to contribute to the knowledge of the sea. Though Canada has the largest coastal line of 31,500 miles followed by U.S.S.R. with nearly 19,700 miles, the features of Tropical seas have important aspects and study of coastal lines as in India becomes imperative for humanity.

The study of sea is important not only for the preservation of space for the man on the earth but also for his 'food'. The human species, growing at the present tremendous rate, will find impossible to feed itself from the food grown on the land. He has to make use of the vast 'ocean' treasures. It is to be remembered that there is a vast plant and animal kingdom under the sea. The deep sea-bed is lower in depth than the height of Mount Everest, for the maximum known depth of the sea exceeds 35,000 ft. In this wonderous world man is not able to penetrate freely except upto a depth of only 200 ft. due to the heavy pressure of water. Except in shallow waters, all methods of investigation are at present blind.

There is a third and important reason for the study of the sea. Our coasts are continually subject to changes by sea action. There is constant erosion in some places and aggradation at another. These tendencies are further increased when we try to utilise the beaches, by construction of harbours, seaside buildings, etc.

BASIC IMPORTANT PROBLEMS FOR STUDY

Many problems pertaining to sea, as stated earlier, remain unsolved. The origin of sand in the seas, its salinity, origin for various move-

ments ranging from tides to littoral drifts. There is an amazing array of simple questions on which we do not have satisfactory answers.

For us in India of particular importance is the movement of littoral sand along east and west coasts. These sands cause obstructions to passage of ships in harbours and at other places as in Kerala cause scouring and erosion of valuable lands. Our annual cost in dredging in the few ports that we have, amount to Rs. 6½ crores and involve removal of over 20 million tons of sand annually. In Kerala alone, the anti-sea works have cost so far nearly Rs. 7 crores and we are at the very beginning of the protection works. We are yet to use the sand conservation method for the preservation of our sea coasts. We must remember that essentially sea is a consumer and not a producer of sand.

If we want to achieve immediate economies even in these limited fields, we have to know as much of data as possible of the seas around us. Observation of data will enable us to evolve proper and cheaper solutions to the problems. To illustrate, we were faced after we achieved independence, to undertake protection measures against damage due to floods in rivers. We started on an immediate programme of investigations such as aerial and land surveys, hydrological studies of the rivers and other connected observations. This collection enables us to concert measures for control over very turbulent rivers like 'Kosi' famous as the 'river of sorrow' of India. It was possible to evolve cheap engineering works. Similarly we should aim at the collection of as much of field data as possible, specially when we are dealing with a difficult and complex subject like sea.

I would like to draw particular attention to 'Importance' of field data. Dr. Terzaghi, the Father of soil Mechanics, first wrote a book dealing with the theoretical aspects of Soil

Mechanics. This is a famous book and was translated into a number of languages and assiduously studied by all soil scientists. Dr. Terzaghi told me that he started thinking of the soil mechanics when he saw some buildings settling down. Years later, he became so convinced about the importance of field data that he said that collection of field data is most essential for further progress of Soil Science. He went so far as to say that he wished that he did not write the first book dealing with theoretical soil mechanics. Collection of field data is thus the most important stage in the development of new sciences. Similarly, in understanding the wonders of sea and in withstanding its onslaught, the most important prerequisite to formulate economic proposals is the collection of field data.

SCIENTIFIC APPROACH

Fortunately there are a number of methods evolved in various other scientific branches that can be readily applied for investigations in the Oceanographic studies. Actually Oceanography is an assemblage of many Sciences—Physics, Chemistry, Geology, Geomorphology, Meteorology, Hydrology, Biology, etc.

Many coastal problems defy pure mathematical and analytical treatments and model research becomes necessary. Realising the importance of severe erosion along our coasts, the Government of India have set up a Beach Erosion Board, which will coordinate data and evaluate natural phenomena and coastal processes. For solving coastal engineering problems, it was proposed to establish a coastal engineering research centre. This has not yet materialised.

With increasing coastal interference by construction of harbours, jetties etc., and construction of storage reservoirs, which result

in entrapment of sediments going to the outfall into the sea, the coastal and nearshore problems have become more complex calling for a determined scientific assault, to understand the forces at work. The recent amazing discoveries must increase our interest in the study of seas. It is discovered that the surface of the ocean near equator is a very complicated structure consisting of water layers with different temperatures. Each layer has a uniform temperature. Also near Guinea on the equator it was found that in depth of the ocean, 4 to 5 zonal streams flow in different directions. In the surface layer, the current is directed eastward, below comes a layer in which the current goes westward, then goes again an eastern current.

CONCLUSION

As the subject of 'Sea' is little known to the public of India in general, it will be useful if a few pamphlets in easily understandable language are issued.

I am glad to know that there are a large number of contributions—as many as 53 papers, dealing specific problems pertaining to Indian coastal line. The papers cover studies of waves, tides and currents, hydrography of Estuaries, shore processes, near-shore problems and biological aspects. I hope the Symposium will stimulate collection of data and accelerate the process of investigations. A study of seas is an essential and inspiring part of a complete study of the earth. I wish the Symposium great success.

Dr. M. S. Krishnan, former Director, Geological Survey of India and National Geophysical Research Institute (C. S. I. R.), who presided over the inaugural session said that Oceanography was a young science in India and that it owed a great deal to Dr. E. C.

La Fond for initiating studies in oceanography. He stressed the need for knowledge of the coasts for a proper understanding of the erosion problems.

Dr. E. C. La Fond, Director, Marine Environmental Division, Sandiego, California, said that co-operation between the various disciplines was essential for the study of Oceanography.

Dr. N. K. Panikker, Director, National Institute of Oceanography and Convenor of the Symposium earlier delivered the welcome address.

Four Technical Sessions were also held where more than 50 papers covering waves, tides, currents and storms, oceanography of the shallow waters etc., were presented and discussed. Delegates from India and abroad belonging to various disciplines such as Physical Oceanography, Chemical Oceanography, Marine Geology, Marine Biology and Coastal Engineering participated in the Symposium.

An exhibition in Oceanography consisting of display charts and oceanographic equipments was organised during the symposium. A film show in oceanography was also arranged.

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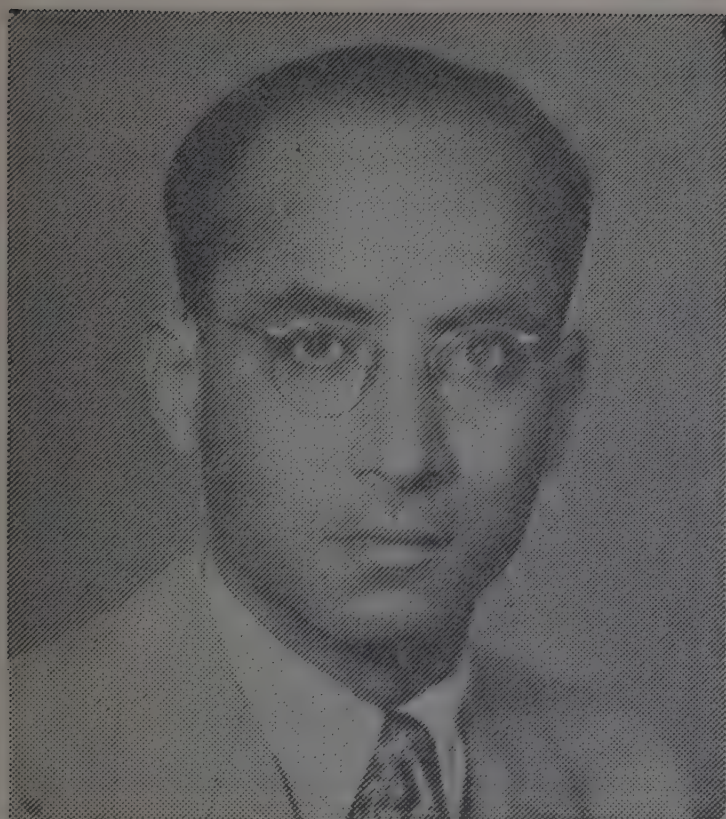
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Some of the Recent Advances in Shrimp Handling, Processing and Storage

Dr. M. N. Moorjani, M. Sc., Ph. D.,
Central Food Technological Research Institute,
Mysore-2

SHRIMP industry is an important resource in India as it yields valuable foreign exchange. Many new grounds are being explored in the hope of greatly increasing the catches.¹ It is estimated that frozen shrimp weighing 28,70,270 kgs. and worth Rs. 2,04,25,493 was exported during 1965.² The chief buyer for frozen shrimp is U. S. A. It is estimated that U. S. requirements exceeded a record high of 300,000,000 pounds in 1965.³ Such factors as these point to a great opportunity for the frozen shrimp industry to expand in India to meet requirements from foreign countries. Consumption will continue to grow if handling and processing are subjected to rigid standards of quality control. In the present article some of the very recent developments in the field of shrimp handling, processing etc. are described and it is hoped that the information may be of some use to the industry

Bacteria of public health significance in frozen seafoods:

A bacteriological study was made of a processed frozen seafood plant in U. S. A. It was observed that frozen raw seafoods entering the plant carried comparatively low levels of

bacteria of public health significance. A definite relation on a frequency basis was found for raw products between total count at 35°C and the occurrence of bacteria of public health significance. Counts less than 10^4 /g, usually indicated coliform, enterococcus and hemolytic streptococcus counts of less than 10/g, and the absence of coagulase positive staphylococci. The high level of bacterial contamination could be minimized by adopting proper hygienic practices in the food industry ⁴

Preservation by chilling:

At the Fifth National Shellfish Meeting in Washington among the various recommendations it was suggested that shellfish should be cooled to 45°F within 5 hours after being caught and thereafter they should be stored at temperatures of between 34° and 40°F.

Tetracycline antibiotic ices have been successfully used for preservation of fish. Since shrimp normally have a higher concentration of Mg^{++} and Ca^{++} than the fish, a possible explanation may exist for the difficulties encountered in the use of tetracycline antibiotics or shellfish preservation.⁵ Results of preser-

vation tests with raw shrimp indicated that dipping the shrimp in a chelating solution increased the efficiency of a subsequent antibiotic dip.

Ultra fast freezing:

The quicker a food product is frozen the quicker the enzyme and bacterial actions are stopped and closer the taste of the frozen food will be to the taste of the natural food. On the basis of this phenomenon a new process of 'jet freezing' food has been developed. In the process cryogenic nitrogen⁶ (-320°F) is circulated in a multizoned freezer at speeds of 7000 ft/min. Thus the large ice crystals produced within the food cells by slow freezing are not formed. Rather, small crystals that are less likely to pierce the cell walls result. The cooling vapours, penetrate quickly and efficiently freeze the product to the core in a matter of minutes—less than a minute in some cases—it is claimed. The units are available in various sizes shapes and weights.

Under the process called Cryotransfer the food product is sprayed with atomized liquid nitrogen.^{7, 8} The unit is mobile and can be used even at the fishing trawler in dock. The revolutionary new freezing system for shrimp was recently placed in operation at the Singleton Packing Corporation in Florida. About 700 lb. 36–42 count shrimp were satisfactorily frozen per hour. It is claimed that 'ultrafast' freezing offers several benefits such as reducing freezing time to a minimum, improving flavour retention and appearance and affecting considerable savings in costs. The method is said to be highly practical from quality standpoint but it requires intricate mechanism and costly specialized maintenance.

Transport refrigerants:

A new approach⁹ to cryogenic refrigeration for trucks, rail cars and shipping containers offers holding low temperatures at -20°F or above by injecting gaseous nitrogen into

ceiling, floor and wall channels. This permits loading cargo upto the ceiling and against the walls.

In order to control the sublimation of dry ice, an apparatus has been just developed.¹⁰ The French rolling stock includes insulated palletised bodies for small shipments less than 250 kg. cooled by dry ice.

Deteriorative changes during frozen storage:

Shrimp was prevented from browning during cold storage by the following treatment.¹¹ Immerse headless shrimp in iced seawater containing 0.5 per cent Na D-isoascorbate for 1 hour. Freeze overnight, glaze with a 0.5 per cent solution of the same reagent and then store at low temperatures.

Extended shelf life for a long list of food products is promised* by a flurry of development work on direct coating of foods with edible or plastic materials. A promising group of films for direct coating are those derived from polysaccharide or from high-amylose starches.¹²

Labour Saving devices:

A new machine for automatic peeling of shrimp has been developed.¹³ One man can handle 800 pounds of shrimp an hour. The automatic machine operates as follows:— Shrimp are dumped by the brushel into a water-filled hopper; they are then pressed by tiny metal 'fingers' against a series of rollers that tear away the shell; then they are pressed against another set of rollers that pick them clean, finally they are dumped on a drain table ready for inspection and packaging.

A Dutch Company has developed a machine which washes and sieves shrimp mechanically.¹⁴ It is especially made for use at sea, the metal being plastic covered and protected against corrosion. The capacity of the machine is

from 5–30 kgs of shrimp every two minute. Experience so far indicates that the improvement in quality can favourably affect the market price of the shrimp upto 20 per cent.

Cleaning food processing equipment and plant deodorization :

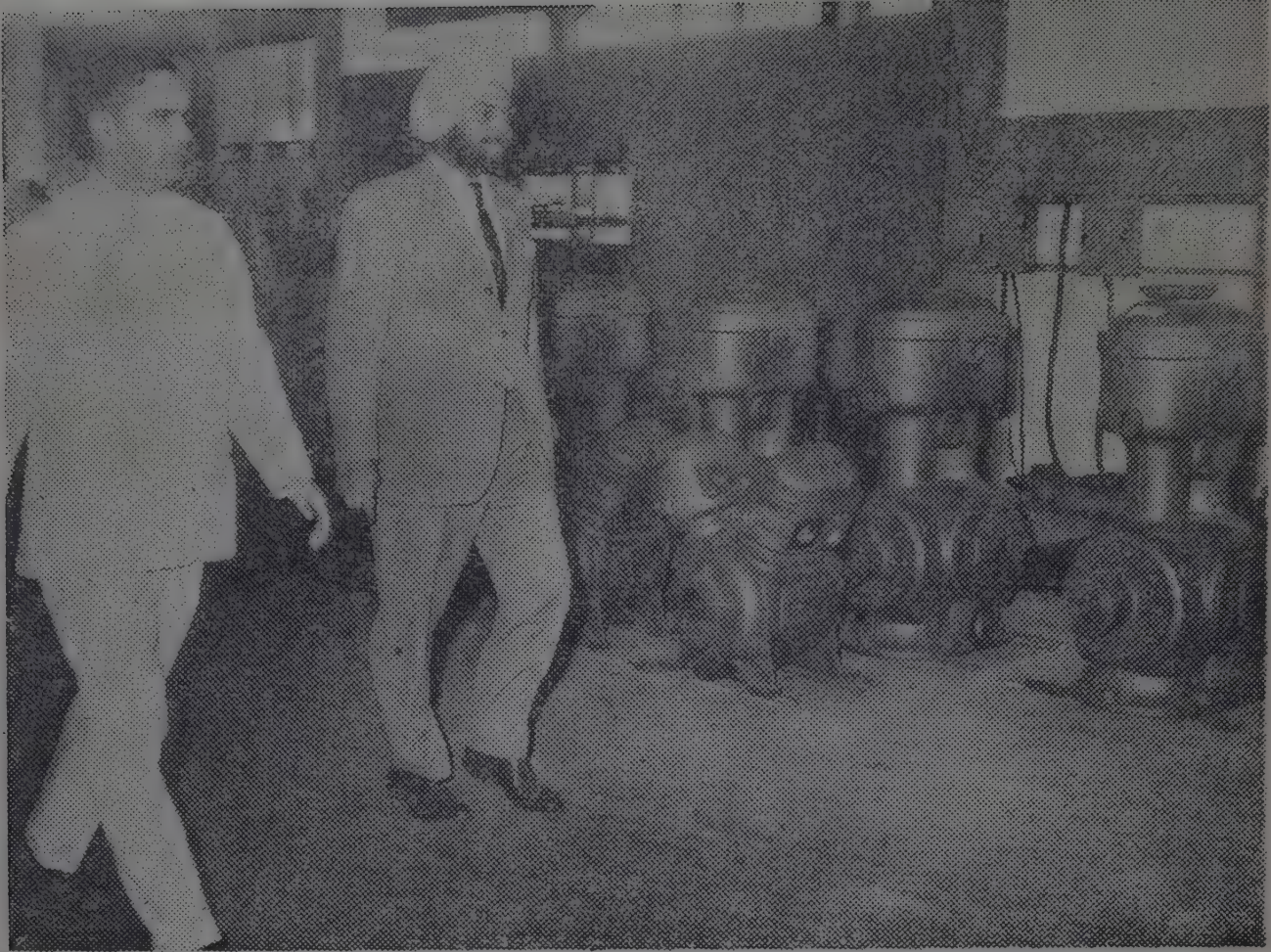
In a recent issue of this journal¹⁵ importance of sanitary conditions has been emphasised during handling of fishery products. Chlorine and by-products containing available chlorine are accepted compounds for the control of microorganisms, cleaning and deodorizing in food industries. A new compound¹⁶ 'Kelite Alkor' (trisodium phosphate hypochloride) has been developed to give performance equivalent to liquid sodium / hypochlorite without the inherent disadvantages of a corrosive liquid requiring packaging in bulky glass carboys. It is moreover not susceptible to decomposition and loss of potency during storage. It combines the sanitary action of free chlorine with deter-

gent properties of phosphates. A concentration of 3/4 oz. per gallon of water contains 200 ppm of available chlorine.

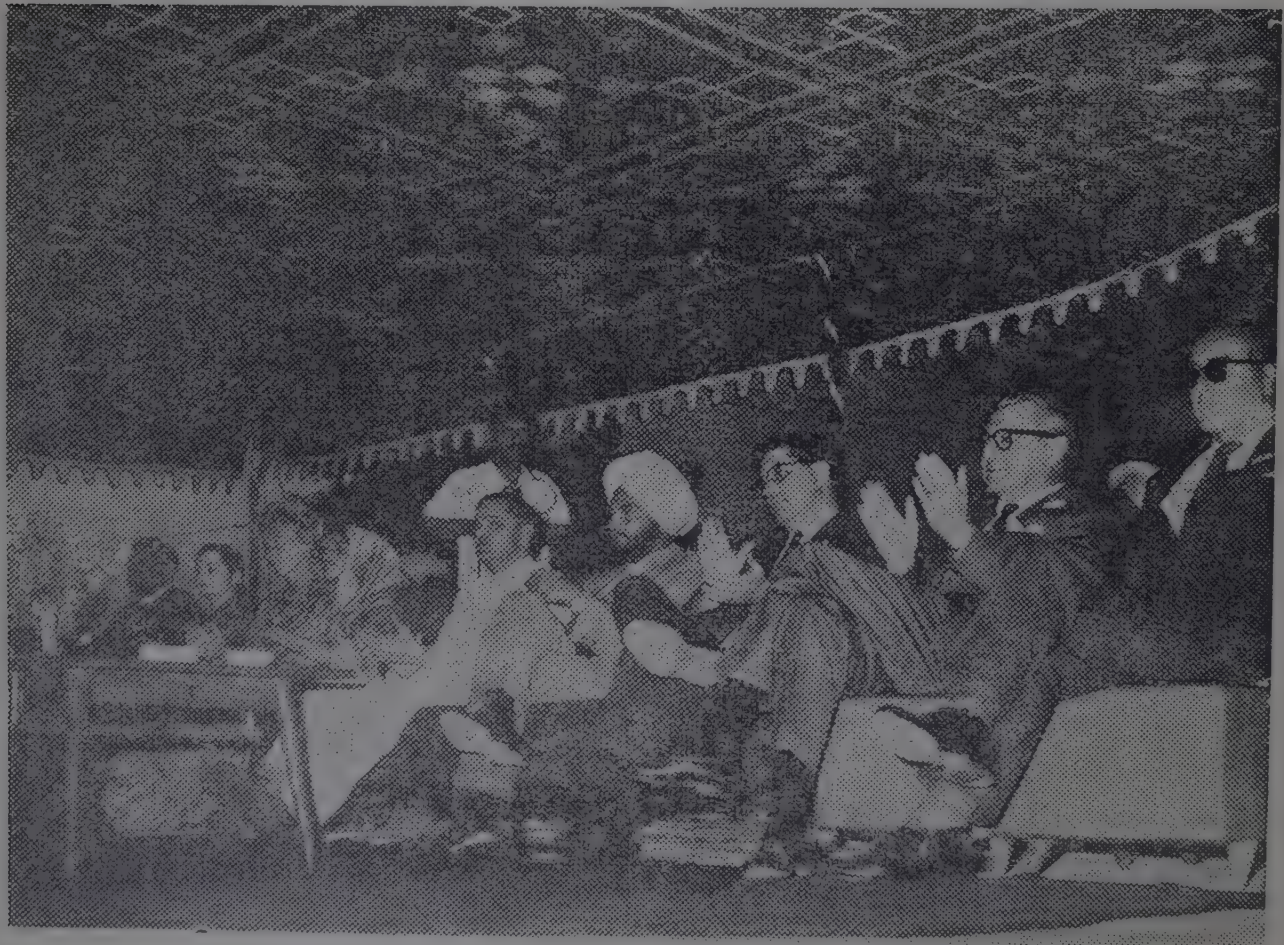
A Canadian Company will shortly place on the French market a patented system for regulating humidity and eliminating odors in all cold chambers or refrigerated store rooms. Thus frequent defrosting is rendered unnecessary and the amount of electric power used is considerably reduced.¹⁷

Processors of high cost foods such as frozen shrimp should exercise strict vigilance on the quality control aspects of shrimp right from the time of catch to shipment stage. It should be borne in mind that freezing will not improve the quality of mishandled shrimp. In today's market adherence to quality control measures or its negligence can mean the difference between profits or losses, success or failure. The cost of reshipment, repackaging, and bad publicity to the processor or manufacturer whose product is not satisfactory can be substantial.

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5. Southcott, B. A. and J. W. Boyd., *Jour. Fish. Res. Bd. Canada*, 22, 117, 1965.
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17. Anon. *Industries Alimentaires el agricoles*, 12, 1218, 1964.



Mr. Manubhai Shah, Union Commerce Minister, going around Frick India Plant. On his left is Mr. Manmohan Singh, Managing Director, Frick India Limited.



Seated second from left: Mr. A. E. Roschli, Chairman, Frick India Ltd.,
 3rd " " : Mr. E. W. Forth, President, Frick Co. Inc. U. S. A.
 4th " " : Mr. Manmohan Singh, Mg. Director, Frick India Ltd.
 5th " " : Mr. Manubhai Shah, Union Commerce Minister.

MANUBHAI SHAH INAUGURATES FRICK INDIA PLANT

Fisheries Look To A Better Future Ahead

MR. Manubhai Shah, Union Commerce Minister, inaugurated the manufacturing plant of Frick India Ltd., at 13/3 Main Mathura Road, Faridabad (Near Delhi) on November 2, 1966. The plant, equipped with the most modern Indian and Foreign machinery, manufacturers refrigeration and air-conditioning machinery needed for the preservation of sea-foods and for such industries as food products, textile, pharmaceuticals, fertilizers, chemicals and for defence establishments. The plant is fully equipped from the casting stage and the manufacture of every major component to the assembly stage and has a production schedule to manufacture Rs. 1 crore worth of airconditioning and refrigeration equipment in 1967 with plans to expand it by 50% in 1968.

Frick has already been playing a considerable important role in the development of fisheries industry in India. All along the coast, and notably in Gujarat and Kerala, Frick has supplied a sizeable number of Quick Freezing plants, cold storage & Ice Plants the existence of which has enabled the fisheries industry to export crores of rupees worth of prawn, shrimp,

lobster and other sea-foods. Speaking on the occasion, Mr. Arnold E. Roschli, Chairman of the Company, said that the plant was being planned to supply equipment and machinery to the whole of South-East Asia. In the beginning 10% of the produce is earmarked for export and the happy feature is that the Company has already got good overseas orders from Singapore, Malayasia and Viet Nam. The Company has financial and technical collaboration with Frick Co., Inc., U. S. A. who hold about 80% shares of the company at present.

Mr. Manubhai Shah, Union Commerce Minister, who had earlier taken a round of the factory was very much impressed with the quality and workmanship of production. Speaking on the occasion, he said that Indian Industry must become export oriented, and he wanted that Frick India should export atleast 50% of its products.

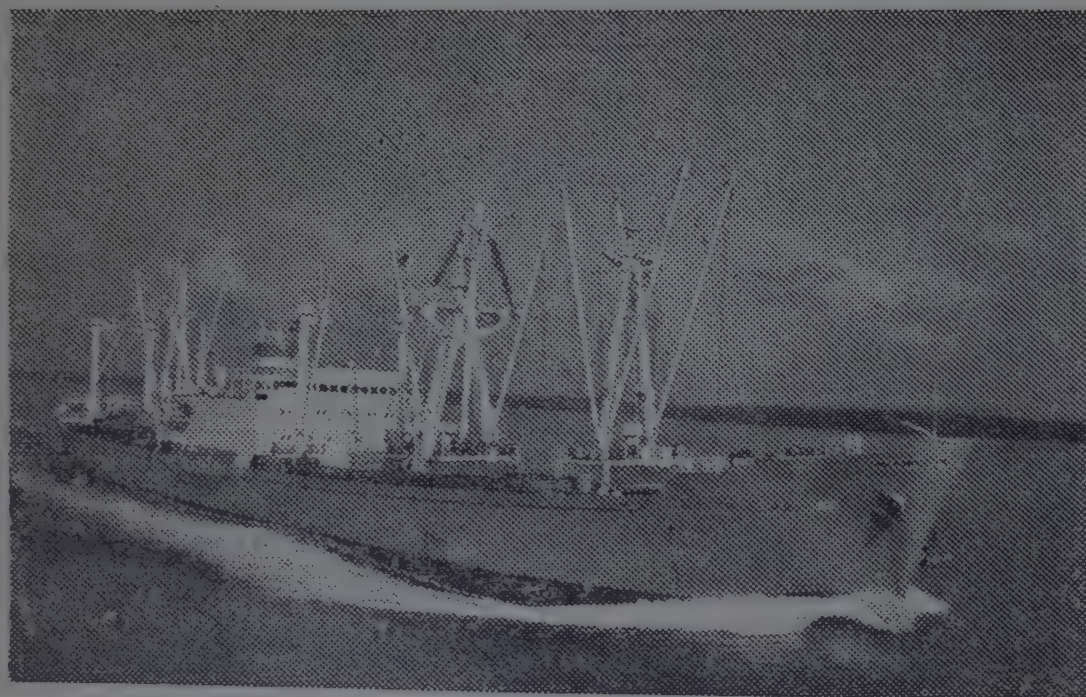
Referring to foreign participation in industry in India Mr. Shah said that it has always been Government's policy to treat

foreign Capital on equal terms with the Indian Capital.

Mr. John M. Seabrook, Chairman of Frick Co. Inc. U. S. A. said that the Company was completely run by Indians and the quality of products was quite equal to their own in U.S.A. Referring to his meeting with the American Ambassador, Mr. Chester Bowles, who had asked him the secret of his successful collaboration, Mr. Seabrook said that it was the

faith and complete trust in the Indian partner which induced him to take the risk of such large investment in India. Mr. Seabrook praised the engineers, workers and the Indian talent on the whole for making this project success.

At present, the Company is importing 30 per cent of the components and is planning to reduce the imported components to 1 per cent in the near future.



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On the Quality of Ice to be Used in Fish Processing Factories

It is a practice in the fish processing industry to transport the raw material from distant places after packing in ice. Processors are generally conscious of the benefit of proper icing in keeping down the temperature of the material during transport. But as it invariably happens the quality of the ice is not generally given the importance it deserves. Studies carried out at the Institute during the past few years have shown that in almost all cases of contamination of raw material by pathogenic organisms like *E. coli*, *Enterococci* etc. the

source is mainly ice and/or water. In the primary processing centres the raw material is almost always in contact with ice until it is dressed and transported to the factories. Under these circumstances the only source of contamination probably is the ice used. In fact it has been seen that raw material having low initial bacterial counts with complete absence of pathogenic organisms, in the course of preparation and pre-process preservation, may get highly contaminated with the organisms when bad quality ice and water are used (Table I).

TABLE I

Bacterial quality of raw material before and after transportation to the processing factory

Bacterial count of the material before transportation				Quality of ice			Bacterial count of material after reaching the factory		
Sample	Total count per gram	Faecal streptococci per gram	<i>E. coli</i> per gram	Total count per ml.	Faecal streptococci/ml.	<i>E. coli</i> /ml.	Total count per gram	Faecal streptococci per gram.	<i>E. coli</i> per gram
1.	6.1×10^4	Nil	Nil	8000	10	20	8.1×10^5	120	35
2.	6.7×10^5	Nil	Nil	7000	13	7	9.6×10^6	380	50
3.	6.9×10^5	Nil	Nil	7500	12	10	9.9×10^6	410	42

It has also been seen that time of contact between contaminated ice and raw material also influences the final bacterial load of the material.

The ice may be contaminated from different sources as shown below:-

1. When prepared from water of low bacterial quality.
2. When it comes in contact with unclean surfaces, for example, when being stowed on unclean boat decks, when dragged along dirty floors etc.

Contamination from the first source can be easily prevented by preparing ice from protec-

ted water or water specially chlorinated for the purpose.

Surface contaminated ice may be washed after washing with chlorinated water. (Chlorine at the level of 5-10 ppm). By washing, bacterial load is reduced and the ice becomes completely free from pathogenic organisms. This can be seen from table below;

From the foregoing it is clear that the ice used in a fish processing factory should be that prepared from good quality water. If ice is not stored and handled hygienically it is necessary to wash it with chlorinated water before using with the fish.

TABLE II

Effect of washing the contaminated ice with chlorinated water (Chlorine at the level of 5-10 ppm)

Bacterial count of the contaminated ice			Quality of the ice after washing with chlorinated water		
Total count per ml.	Enterococci per ml.	E. coli per ml.	Total count per ml.	Enterococci per ml.	E. coli per ml.
1. 7.1×10^3	15	10	1.3×10^3	Nil	Nil
2. 7.3×10^3	125	20	1.1×10^3	Nil	Nil
3. 8.1×10^3	109	15	1.8×10^3	Nil	Nil

(Fish Technology Newsletter)
Issued by Central Institute of Fisheries Technology.

FISHERIES IN FOURTH PLAN

Though fish is an accepted item of consumption in several parts of the country and its place in a balanced diet is well recognised, the gap between the production and requirements of fish for the purpose of an adequate standard of nutrition is still substantial because of the low level of exploitation of the country's vast resources in fisheries. In recent years the development of marine, estuarine and fresh water fisheries has centred on improving the scientific and technological bases of catching operations, culture, preservation, processing and marketing of fish and subsidiary products.

At the beginning of the Third Plan the base-line production was estimated to be 14 lakh tonnes. This was sought to be raised to 18 lakh tonnes by the end of Third Plan period. In 1961-62, however, the estimate of base-line production was revised to 9.63 lakh tonnes and the target of production for 1965-66 was set at 11.5 lakh tonnes consisting of 3.5 lakh tonnes of inland water fish and 8 lakh tonnes of marine fish. The outlay for fisheries is proposed to be increased to Rs. 113 crores. The production of fish is expected to increase from 11.5 lakh tonnes in 1965-66 to 15.3 lakh tonnes in 1970-71.

Deep sea fishing has undergone extensive and rapid technological progress abroad. As India's marine resources are rich in fish, stress was laid in the Third Plan on introducing technological changes to improve marine fishing capabilities. In the Fourth Plan, further stress

will be laid on raising the technological status of the industry and expanding the fisheries co-operatives so that they may play an increasingly important role in production and marketing. In particular, it is proposed to acquire 200 trawlers, construct 8000 mechanised boats and increase the output of other ancillary equipment for off-shore and deep sea fishing. It is proposed to develop fishing harbours, set up more ice and cold storage plants and provide refrigerated vans for long distance transport from the points of landing to the points of consumption. In respect of inland fisheries the major part of the increase in production is expected to be derived from presently unutilised but potentially rich water areas, intensive exploitation of existing culturable waters, reclamation of derelict water areas and other measures.

Facilities for research and training as important adjuncts to development, will be expanded to accelerate the pace of conversion from traditional methods to modern mechanised methods of exploitation of fisheries. These include strengthening of the Central Marine Fisheries Research Institute at Mandapam, the Inland Fisheries Institute at Barrackpore, the Fisheries Technological Institute at Ernakulam, and the Off-shore Fishing Stations at several places. The Central Fisheries Education Institute at Bombay will be enlarged to provide greater training facilities for personnel engaged in different areas of the industry.

(Draft outline of Fourth Plan)

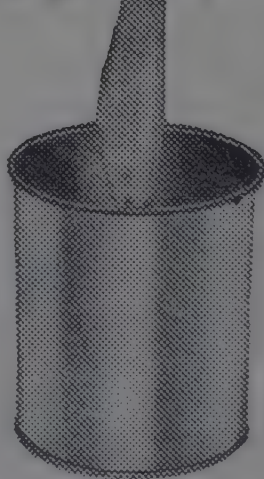
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FISHERIES CO-OPERATIVES

The number of fisheries' co-operatives stood at 2912 in 1963-64 with 295,705 members. The value of sales made by these societies during 1963-64 was Rs. 2.44 Crores. The Study Group on Fisheries Co-operatives has recommended that at least 50 percent of the production should be forthcoming from the co-operative sector in the fourth plan. The Conference of Directors of Fisheries held in June 1965 recognised the important role of co-operatives in mechanised fishing and recommended that in future mechanised boats should be issued only through co-operatives. This and the following other guidelines were commended to the State Governments by the Department of Co-operation in October 1965 :

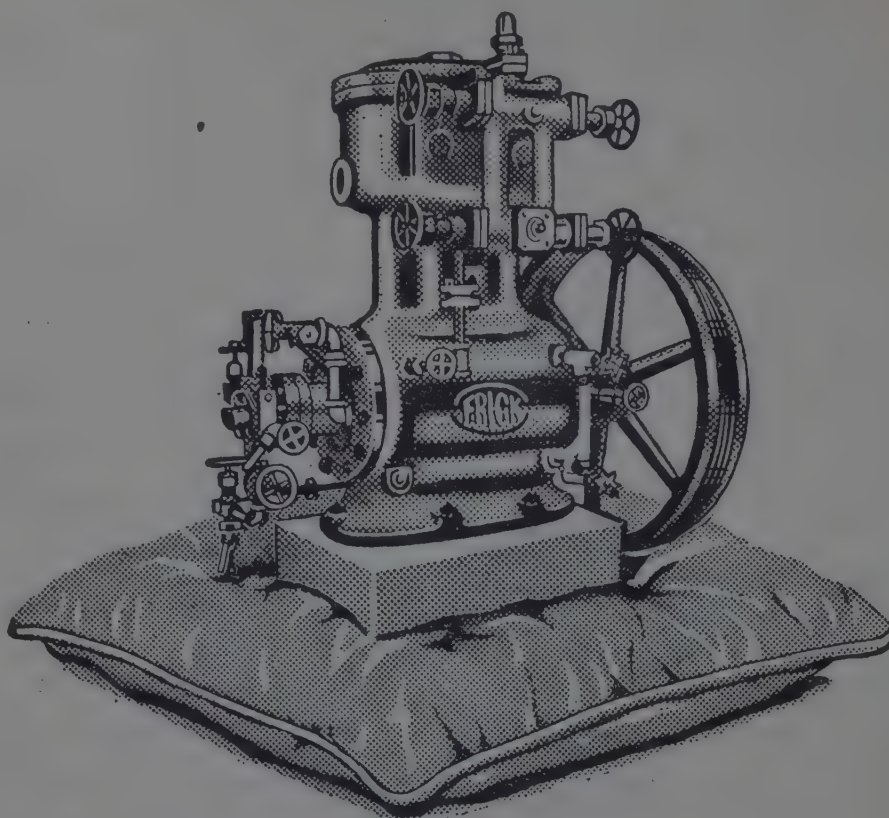
- (i) Primary fisheries' co-operative societies should be organised and affiliated to the marketing and supply unions around each important fishing

harbour. The unions should undertake collection, marketing, processing, supply of requisites, provision of ice and freezing facilities and also construct boats.

- (ii) Trawlers may be operated departmentally or through some other agency if the co-operatives cannot take up the programme immediately.
- (iii) There should be a co-operative cell in the Fisheries Department.
- (iv) Well trained and qualified persons having business experience should be appointed as Managers of fisheries co-operatives.

The programme for fisheries co-operatives in the Fourth Plan will be generally on the above lines.

(Draft outline of Fourth Five Year Plan)



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NEWS and NOTES

Seastar Inc., New York.

Mr. Robert S. Russel, President of Seastar Inc., New York, a Seafood Importing firm of U. S. A. visited Cochin during the second week of November. During his stay in Cochin Mr. Russel visited some of the processing factories and held discussions with leading exporters on the possibility of increasing export of Frozen Seafoods.

Bien Trading Co., New York.

Mr. George J. Zeppos, Vice-President, M/s. Bien Trading Co., Inc. New York, during his business tour of Asia and the Far East visited Cochin during the 2nd week of November and had discussions with several exporters of Canned Seafoods which his firm is interested in importing in large quantities.

Cyclone hits East and West Coasts of South India

A severe Cyclone hit the East Coast of South India during the first week of the month followed by a similar one hitting the West Coast during the second week. Large scale destruction and damage to property besides loss of life was reported. A large number of mechanised fishing vessels was damaged besides 6 boats reported lost around Cochin Port alone. An

equal number of fishing craft was either lost or damaged. Loss of life of fishermen was also reported. The fury of the Cyclone also caused heavy damages to the fishing villages all over the South East and South West Coast of the country. Many were rendered homeless. Loss was estimated at several lakhs of rupees.

Urgent relief measures have been initiated by the State Governments. it is reported.

Bamboo containers to carry fish

Fish hereafter can be transported with the conventional refrigeration equipment. Insulated drip-proof hardy bamboo containers have been perfected by the Central Food Technological Research Institute, Mysore, for this purpose. The containers shown to pressmen have a capacity of 2.25 cubic feet weighing about 7 kilos capable of holding fish weighing 25 to 35 kilos. Each container was designed to last at least 6 trips, according to the authorities of the Institute.

Rs. 12.5 Crores for Fisheries Development in Kerala

It is proposed to invest Rs. 12.5 Crores for Fisheries in Kerala during the 4th Plan period.

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Travancore-Cochin Prawn Curers Co-operative Marketing Society enters Canning

The Society has put up a new Canning plant in Cochin. Production of Canned Seafoods has started from there recently.

Prof. L. M. Pylee Nominated to Marine Council.

Prof. L. M. Pylee, President, Mechanised Fishing Vessel Owners Association, has been nominated by the Government of India as a member of the Marine Products Export Promotion Council, in the vacancy caused by the death of the late Rao Sahib C. J. Mathew.

Demand for Cash Incentives to Seafood Exports.

The committee also considered the demand for Cash Incentives for Seafood Exports, raised by Shri Kurwath Damodaran, and decided to refer the matter to the Marine Products Export Promotion Council for its views.

Shipping Facilities with reefer space to Antwerp.

The Regional Export Import Advisory Committee at its meeting held recently at Cochin after considering the difficulties experienced by the shippers of Frozen Froglegs to Antwerp

owing to the shortage of Reefer Space, as pointed out by Shri Kurwath Damodaran, has recommended that the Conference Lines may be urged to make every effort to provide adequate reefer space in their vessels to ports in UK/Continent.

Coastal Highway for Madras State.

The Government of Madras proposes to develop the East Coast road from Madras to Kanyakumari as National Highway aligned to connect the port of Madras with the Minor Ports of Cuddalore, Nagapattinam and Tuticorin besides fishing villages and tourist centres.

Nautilus Imports Inc. New York

Mr. Irwing D. Steins, Vice-President, Nautilus Imports Inc., another Seafood Importing firm of U. S. A. was also in Cochin during the first week of November for negotiating business with local exporters.

National Institute for Ocean Research

A national institute for the study of the Ocean is proposed to be established by the Government of India in Goa with research units functioning under it in Cochin, Waltair and Calcutta, it is stated.

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U. S. A. Shrimp Market

The very large shell-on headless Shrimp, such as U/10, U/15 and 16/20's are very firm but all smaller sizes of shell-on headless shrimp weakened considerably during the first and second week of the month. Sizes such as 26/30 have declined as much as 5 Cents in the first ten days of the month.

On the other hand, all peeled and deveined shrimp seem to remain very steady and on the stronger side. Peeled and deveined have a very strong tone and although official Green Sheet prices have'nt changed in the first week of the month the market has a defenite strong appearance.



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Item-wise Exports of Marine Products During October 1965 and 1966

Items	October 1965		October 1966	
	Qty. (kgs.)	Value (Rs.)	Qty. (kgs.)	Value (Rs.)
Shark Fins & Fish Maws	N. A.	N. A.	10,450	61,326
Dried Prawns	1,63,283	3,57,386	1,05,830	5,78,718
Dried Fish	11,31,213	16,76,679	9,21,471	20,73,348
Frozen Fish	N. A.	N. A.	....	...
Frozen Prawns	5,80,635	36,10,410	6,29,495	88,46,876
Frozen Lobster Tails	7,217	99,300	5,348	1,10,185
Frozen Froglegs	20,683	1,20,769	31,098	3,39,783
Canned Prawns	99,258	8,58,811	69,811	10,17,167
Fish Pickles	N. A.	N. A.	119	844
Prawns Powder	1,928	8,321	1,461	669
Fish Oil	...	...	8,480	9,094
Sea Weeds	...	...	55,719	1,33,676
Sea Shells	...	...	10	472
Beach-dry-mer	...	...	3,500	3,600
Fish Bones	...	...	7,977	22,935
Total	20,04,217	67,31,676	18,50,778	1,31,98,693
January to October	1,34,02,406	5,81,15,022	1,59,39,134	10,84,12,296
April to October	92,10,742	3,83,67,079	1,19,09,953	8,72,68,988

Source: Marine Products Export Promotion Council).

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VOL. 1 - Nos. 8 & 9

DEC. '66 - JAN. '67

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VOL. 1

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DEC. '66 - JAN. '67

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OUR COVER

Traditional "Pole & Line" fishing is still in vogue in Kerala. Picture shows fishermen engaged in this lucrative avocation in the calm backwaters of Cochin. Seen in the background are the ancient "sailing craft" which continue to play their useful part in carrying on the coastal trade.

Seafood Exporter

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Editor.

Editorial

FOR the future of the world Shrimp Industry the formation of International Shrimp Council at New Orleans, U. S. A. augurs well. Set up with the principal object of promoting sales of Shrimps in the U. S. A., we understand that it proposes to enlist all Shrimp nations as members and embark upon a large-scale publicity programme in future.

It is only too well-known that of late Shrimp has become a popular item of menu all over the world and many countries have developed this industry in a large way. India, the second largest exporting country to the USA, with her ambitious developmental projects under way, has, therefore, rightly taken the decision to join the Council. India's position as a Shrimp Nation has also been well-recognised by the election of the Chairman of the Marine Products Export Promotion Council as a Director of the Shrimp Council. It is but meet and proper, therefore, that India should have made a sizeable contribution towards the budget of the Council as a prelude to further cooperation towards achieving the Council's objectives.

With an annual Promotional programme to the tune of \$3,00,000, the Council is expected to initiate a large-scale programme of publicity in the U. S. A. in the first instance and extend it to other spheres as time goes on. Though the Shrimp is accepted as a delicious item of the menu the world over, it must be remembered that as a result of intensified exploitation and developmental activities initiated by the Shrimp nations a substantial increase in production could reasonably be expected. It is, therefore, all the more necessary to attract a greater number of consumers to keep pace with production. Unmistakably it

is this task which has now been taken up by the International Shrimp Council. The Shrimp Industry of the world will doubtless look to the Council to popularise Shrimp among the consumers keeping the increased production in view. The U.S.A. being the main consuming country today, the decision to locate the Council there and selecting that area for exploitation during the first year of the Council's activities is but appropriate and welcome.

We have no doubt in our minds that the activities of the Council will not only induce more and more Shrimp Nations to come forward and join it, but provide an opportunity for international cooperation and coordinated efforts in all facets of the Shrimp industry including promotional activities.

The first meeting of the Shrimp Council to be held in Mexico City in June next and expected to take far reaching decisions could very well be an epoch-making event for the Shrimp Industry. Let us hope that it will place the industry on a sound and proud footing. Here is wishing the International Shrimp Council well in its task!

EDITOR'S NOTE

Owing to unforeseen factors we regret that the December issue of the "Seafood Exporter" could not be brought out in time. We have, therefore, decided to combine the December and January numbers into one. We trust the readers will bear with us in this matter.

CENTRAL INSTITUTE OF FISHERIES

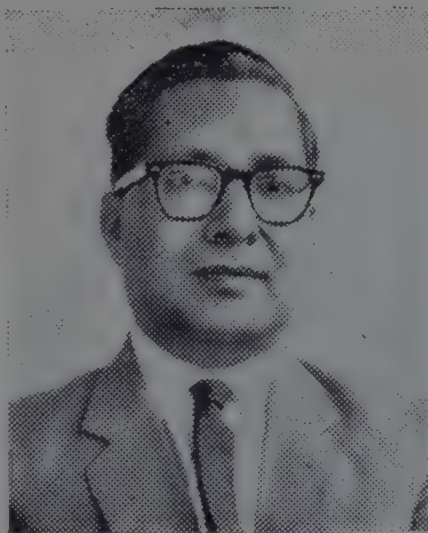
TECHNOLOGY

(Sponsored in 1957 by the Government of India, under the Department of Agriculture, Ministry of Food & Agriculture, the Institute has grown in stature and activity. The following is a resume of its useful and valuable activities which, we are sure, will be read with interest).

The first unit of the Institute which was started in Cochin comprised the Craft and Gear Wing. In 1958 the Processing Wing was added to it and the Headquarters of the Institute began functioning from Ernakulam. The Extension and Statistical Wing of the Institute was established in 1961.

To facilitate on-the-spot study of the problems peculiar to different regions in the country where fish and fishing conditions varied, the Institute set up sub-stations at Veraval (Gujarat), Kakinada (Andhra Pradesh), Burla (Orissa) and units at Bombay, Calicut, Goa and Nangal (Punjab). One mobile unit was also brought into existence. Research work at the Institute

including, of course, the Sub-stations and Units is carried on in two wings namely the Craft and Gear Wing and the Processing Wing.



DR. A. N. BOSE
DIRECTOR OF THE INSTITUTE

The Craft and Gear Wing

This wing, besides designing of boats, studies on craft, gear and mechanical accessories, fishing methods and gear materials and also investigates on engines used in fishing boats. This wing comprises two branches namely :-

Gear Branch:

- Material Section
- Fishing Methods Section
- Gear Designs Section
- Boat Design Section
- Craft Material Section

Craft Branch:



A section of the Bacteriology Laboratory at the Institute.

and Mechanical Engineering
Section

Processing Wing

The activities of this wing cover all phases (both fundamental and applied aspects) of fish processing technology. The various research activities are undertaken in the following sections of the Wing:

1. Chemistry, 2. Bacteriology and Microbiology, 3. Processing and Engineering, 4. Fish Curing, 5. By-products, 6. Quality Control and Inspection.

The Substation at Veraval carries out work on problems related to both processing and fishing craft and gear. The work done in the Substations at Kakinada and also in the units at Nangal and Goa is aimed at evolving efficient gear and fishing methods so as to suit the conditions in the respective area. The units at

Bombay and Calicut investigate with problems of fish processing with particular reference to the types of fish available and processing techniques followed in the respective area. The mobile unit attends to short-term exploratory and experimental gear work at various places in the country.

Some of the important investigations undertaken by the Institute come under the following heads.

Processing Wing

1. Biochemical investigations on fish and shell fish. 2. Studies on the microflora of fish, shell fish and processed fishery products including methods of enumeration of bacteria. 3. Studies on froglegs. 4. Studies on fresh fish preservation. 5. Studies on freezing of fishery products. 6. Studies on transport of fish and shell fish. 7. Studies on Canning of fishery products. 8. Studies on preparation of specialty products from fish and shell fish. 9. Dehy-

dration of fish and shell fish. 10. Utilisation of factory wastes and fishery byproducts. 11. Factory Sanitation. 12. Process Control and Product quality. 13. Studies on curing and cured fish products. 14. Studies on accelerated freeze-drying of fresh and cooked fish as well as precooked food products from fish.

Craft & Gear Wing

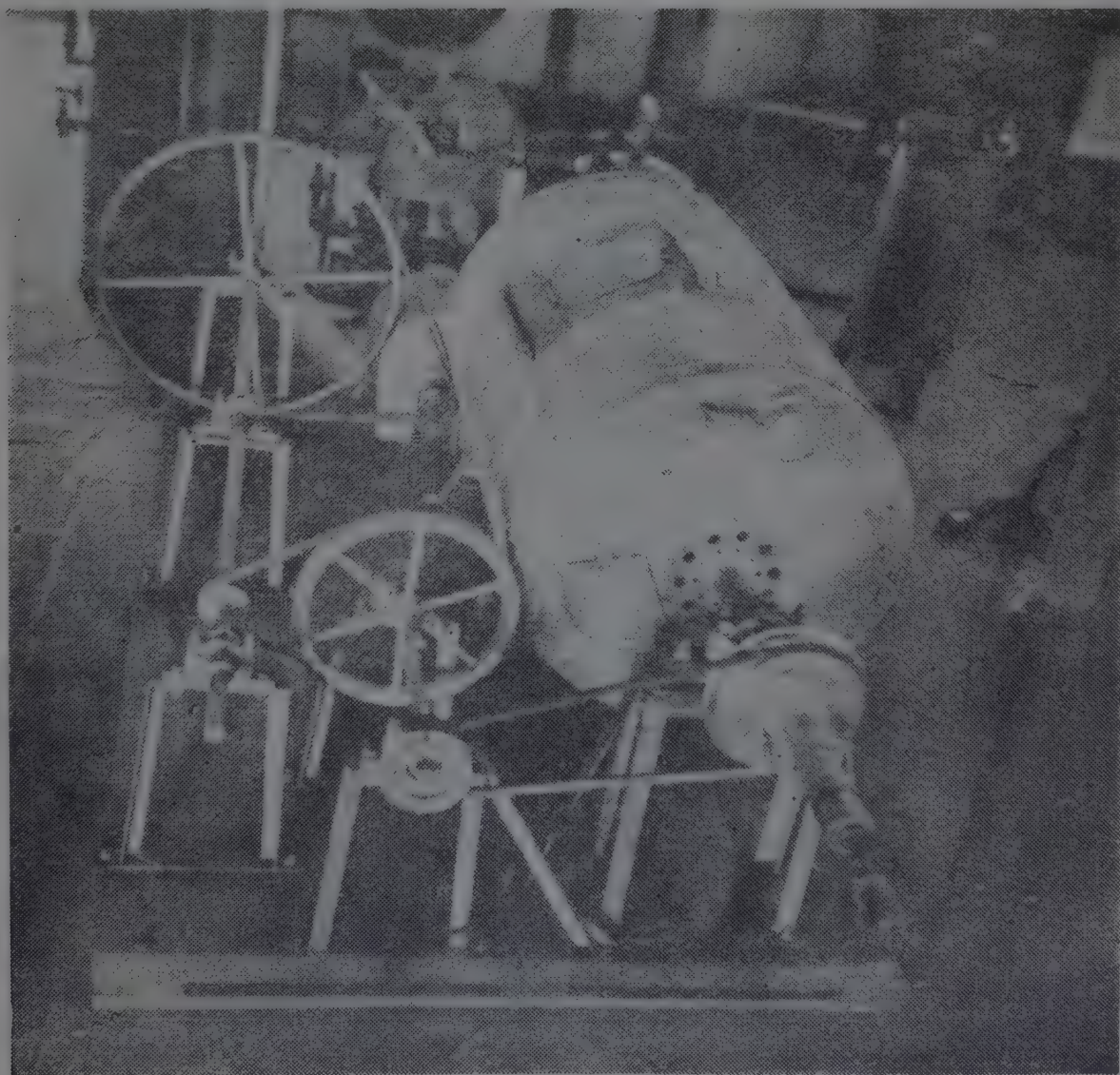
15. Studies in trawl fishing. 16. Studies on set net, bagnet and traps. 17. Studies on Gill nets, Lines. 18. Studies on Electrical and Line fishing. 19. Gear Materials. 20. Designs of Fishing Boats. 21. Boat building materials. 22. Testing of engines and accessories. 23. Investigations on Weed control. 24. Testing of electrical and electronic equipments.

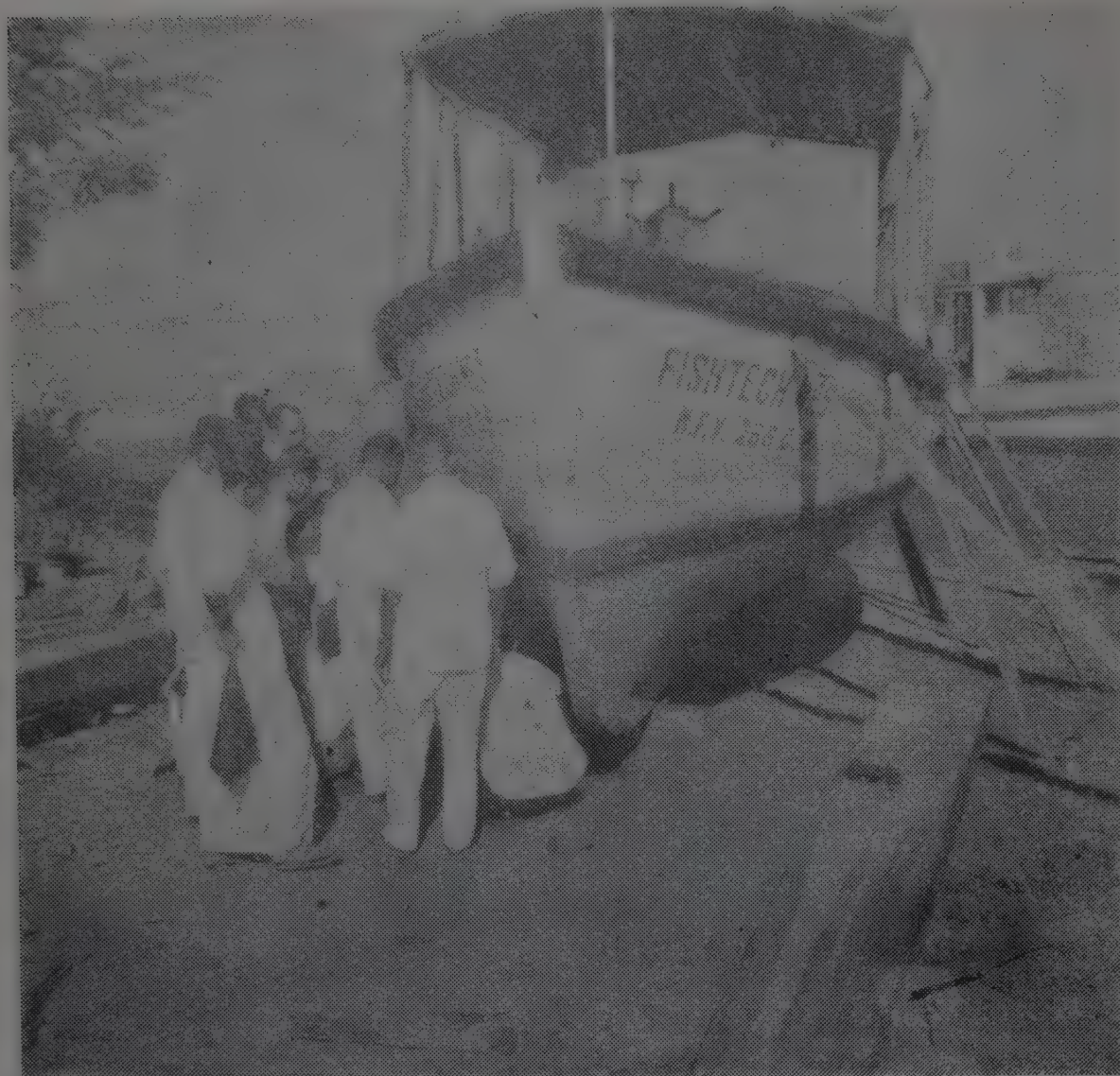
Results of Research

The Institute has made rapid strides in the various fields of investigations. Given below are some of the most important results achieved:

- 1) Eight prototype designs of mechanised fishing boats between 25 ft. and 50 ft. length overall and several designs of gear have been finalised and have been adopted by the State Fishery Departments and private fishery interests. Besides, designs of fishing vessels for operation in large reservoirs and rivers as well as layout and specification for 93' fishery training vessel and 50 ft. and 60 ft. Steel trawlers have also been prepared. More than 2000 boats and nets according to the designs of this

A pilot Model of the Half-ton Rotary Fish-meal Dryer designed by the Institute installed in the processing section. The Dryer is suitable for drying prawns also.





Participants of a 'Open House' conducted by the Institute examining the 30ft Boat (Fishtech V) constructed of Venteak G. I. Fastenings, Cast Iron fittings and sheathed with Aluminium Magnesium Alloy.

Institute are in operation in the States of Gujarat, Maharashtra, Goa, Mysore, Kerala, Madras, Pondicherry, Andhra, Orissa and West Bengal.

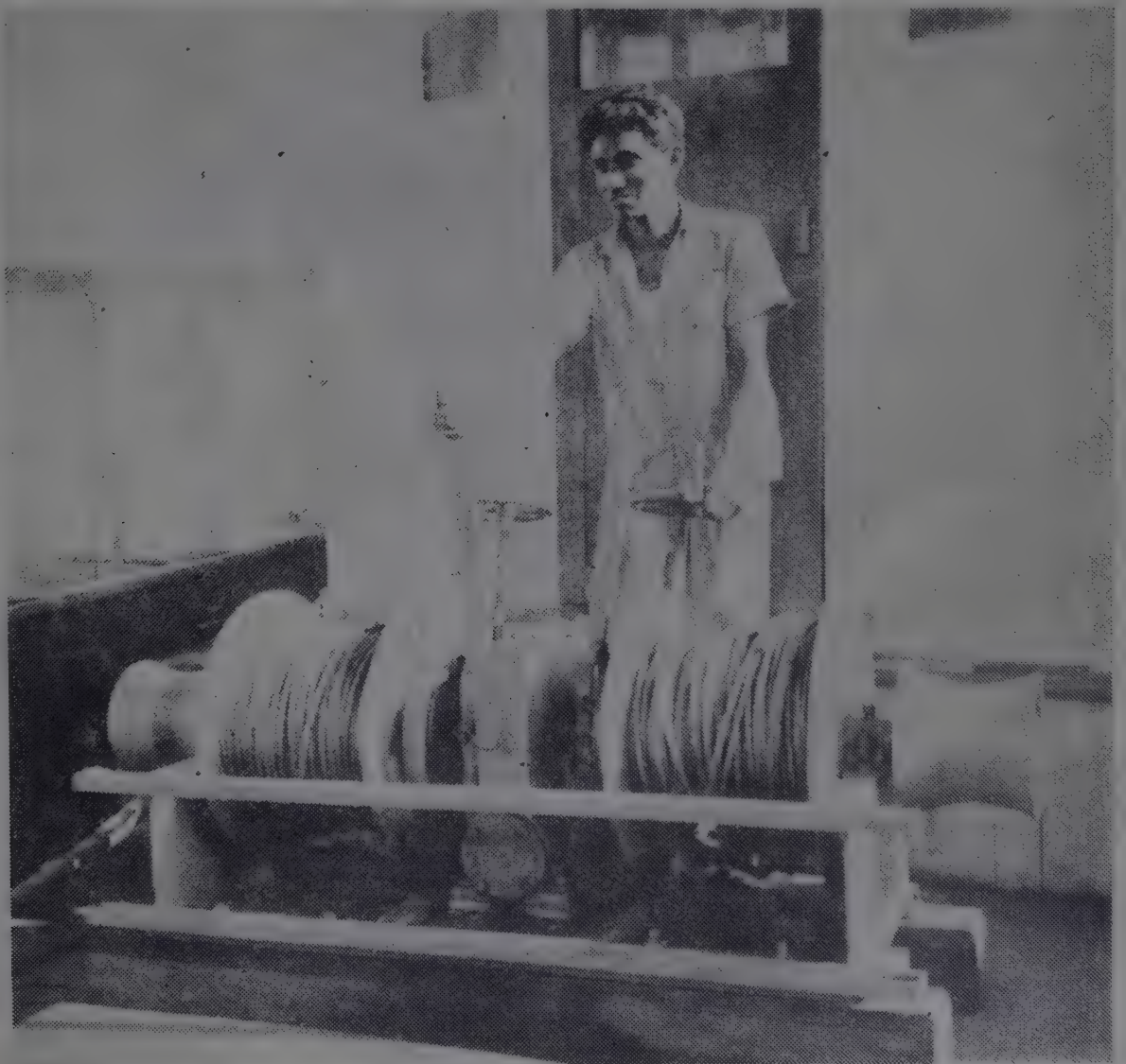
- 2) A method of proper selection of propellers in the case of small trawlers to increase the trawling performance and a method of predicting the towing pull have been developed.
- 3) Trawling, a new method of fishing in this country, has been introduced in commercial fishing. Many new trawling grounds are now under systematic exploitation along the coasts of Gujarat, Maharashtra, Kerala, Mysore and Andhra Pradesh.
- 4) Quality standards have been prescribed for the Nylon twines made in the country.
- 5) Improved and more effective methods of preservation of fishing nets evolved have been recommended to the States Fishery Departments who in turn have adopted these techniques.
- 6) The correct method of ventilation of engine rooms with air cooled engines in small fishing boats has been found out.
- 7) Venteak, a cheaper wood, has been found to be suitable timber for the construction of mechanised fishing boats.

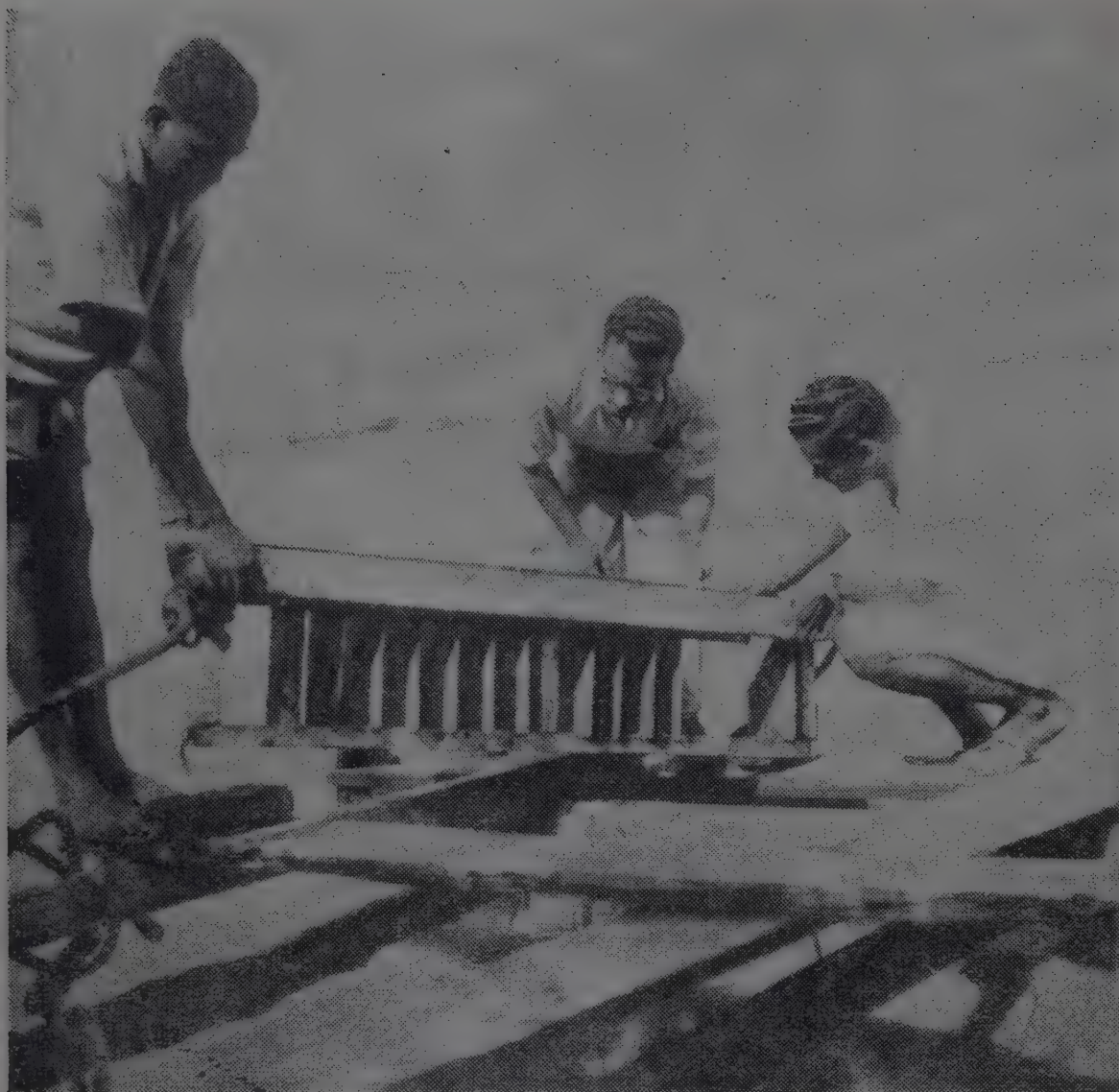
in addition to the more expensive Teak and Aiyini.

- 8) The indigenous aluminium-magnesium alloy, it has been found, can be used as a sheathing for wooden hull in place of the conventional and more expensive copper sheets that have to be imported.
- 9) From the construction of two prototype fishing boats (30 ft. and 50 ft.) at this Institute, it has been clearly demonstrated that a considerable reduction in the overall cost of fishing boats can be achieved by using Venteak, G. I. fastening, Aluminium-magnesium alloy for the hull sheathing and cast iron fittings.

- 10) A suitable painting schedule for the under-water aluminium-magnesium alloy sheathing of boats has been worked out. A method of protecting wooden structures under marine conditions using creosote and Ascu (Copper-chrome-Arsenic compound) has been developed.
- 11) Galvanic protection and anti-fouling measures have been worked out for use of aluminium alloy in sea-water.
- 12) A power-take-off clutch has been designed, fabricated and tested for the power transmission to winches in small boats.
- 13) An equipment has been designed, fabricated and successfully tested for dewatering of bheels.

A trawl winch of the Institute's design in operation in Fishing Boat.





Wooden Panels being examined at the test site of the Institute for the effect of Marine Borers and Foulers.

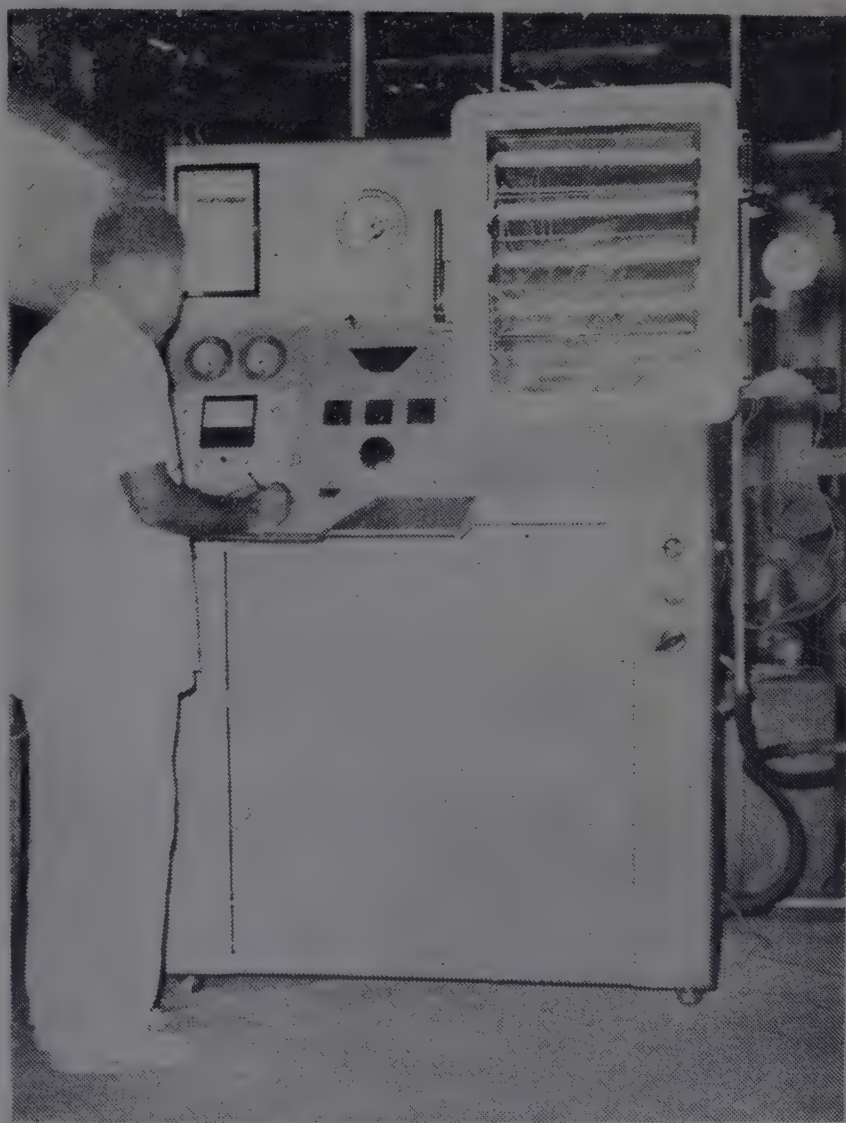
- 14) An Impulse Generator has been designed and fabricated.
- 15) By testing a number of Indian woods, it has been proved that "Andaman Bullet Wood" can be used as stern bearing.
- 16) A number of designs of winches and other mechanical fishing accessories have been made and are regularly supplied to the fishing interests.
- 17) The studies carried out at the Institute on fresh and ice-stored-fishery product have brought out (a) the optimum conditions of icing (b) optimum period of ice-storage in relation to suitability for processing and (c) the nature and extent of losses by leaching during ice storage.
- 18) Considerable improvement has been achieved from the point of view of quality of Indian processed fishery products. The extent of contamination of the products at different stages of processing was assessed and preventive measures suggested to the industry. The quality was judged at every stage and defects pointed out. Charts showing the stage to stage, day to day and source to source variations prepared and made available for guidance to them.
- 19) More efficient cleaning schedules suitable to the conditions existing in Primary Processing Centres as well as

in factories have been worked out and demonstrated at different fish processing centres in the country.

- 20) Methods have been standardised for canning of prawns, other crustaceans like clams and mussels, marine fishes like sardine, tuna, mackerel, pomfret, seer fish and lactarius and fresh water fishes like mirror carp.
- 21) Methods for freezing of prawns, lobsters, froglegs and fishes like sardine, mackerel, marlin, lactarius etc. have been worked out.
- 22) An effective method of treatment has been developed for improving the colour and quality of frozen frog legs.
- 23) A portable thermistor thermometer was developed and constructed for studying the temperature fluctuations in consignments of frozen prawns transported from freezing plants to the Wharf.
- 24) A simple method of quick approximation as well as accurate determination of bacterial load in fresh fish products have been developed. Methods have also been developed for very quick and accurate estimation of E. coli in fresh and processed fish products.
- 25) A method has been worked out for preparation of commercial factice (mineral rubber) from sardine oil.
- 26) It has been shown that mixed preservatives containing propionic acid are very effective in preventing red halo-

philic and fungal attack on cured fishery products. Several trials and demonstrations have been made to popularise this new technique of preservation of salted fish products.

- 27) Different types of fish dryers—tunnel type and Rotary Drum type—have been designed for drying fish products.
- 28) Methods have been worked out for the preparation of speciality products from fish and shell fish viz, shrimp extract, crab extract, fish flakes, breaded fish etc.



The Accelerated Freeze-Dryer Installed at the Processing Section of the Institute.

- 29) A successful method has been developed for the preservation of trash fish in liquid form. Preservation is effected by lactic acid produced by lactobacillus organisms added to the fish under controlled conditions.
- 30) A variety of additional products which have water repellent as well as lubricating properties have been prepared from heat processed sardine oil. These new products are now on extensive trial.

Services rendered by the Institute to the Fishery Industry

The Institute is the only one of its kind under the Central Government to be of help to the developing fishery industry of the country in solving the numerous technical and technological problems faced by it.

The Institute renders very useful service to the industry through the extension and statistical wing, its third wing, through:

1. The publication of a Quarterly by name "FISH TECHNOLOGY NEWS-LETTER," published in non-technical language and distributed free of cost to the industry, State Fisheries Departments and related organisations,
 2. Booklets and leaflets published on important findings made and new or improved techniques evolved at the Institute,
- and,
3. Field demonstrations, 'Open houses' and talks conducted for popularising the improved or new techniques developed.

The Institute attends to a large number of Technical queries and furnishes specific, detailed and upto date information. Technical notes are also prepared and sent on specific requests.

The Institute also renders technical assistance to the fishery industry and related industries like those engaged in fishing boat construction, manufacture of mechanical fishing accessories etc., to the State Fisheries and related departments and to all others asking for such assistance. The industry is closely observed for finding out the technical problems faced and guidance needed by it and to give specific suggestions after carrying out investigations if necessary. The Quality Control Section of the Institute also carries out regular checks on the products of fish processing factories and advises the industry on various steps to be taken to improve the quality of its products.

The designs and all relevant details regarding different fishing gears, mechanical fishing accessories, processing equipments etc. developed at the Institute are supplied free of cost on request. Besides, boats for specific purposes are also designed and supplied at the request of the Government and State Fisheries Departments and Research & Training Institutions.

Facilities also exist in the Institute for giving ad-hoc training in all branches of fish processing and craft and gear technology. Such ad-hoc training has been given from time to time to persons sponsored by the industry, State Fisheries Departments etc. in fish processing techniques and special subjects like fish biochemistry, microbiology etc. Training has also been given in fishing boat and gear designing, construction of boats, fabrication of nets etc.

Quality Control Inspection Scheme.

The Government of India introduced compulsory preshipment inspection and quality control of frozen and canned prawns with effect from 15th March 1965 and for frozen froglegs in March 1966. The Central Institute of Fisheries Technology was declared as the authorised agency for the preshipment inspection. Within an year from the inception of the Scheme about 8000 tons of frozen prawns and 1000 tons of canned prawns were inspected for issue of preshipment inspection certificate.

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AT THE SHRIMP COUNCIL MEETING

The Board of Directors of International Shrimp Council met in New Orleans on the 14th of November 1966. Shri V. M. Srikumaran Nayar, the Chairman of the Marine Products Export Promotion Council who is one of the

Directors of the International Shrimp Council, attended the meeting.

The Board gave serious thought to the question of initiating a publicity programme



(Left to Right) Mr. John Mehos, Chairman, Shrimp Promotion Committee, I. S. C., Mr. K. D. Sharma, First Secretary (Commercial) Embassy of India, Washington, Mr. Vtrgil Versaggi, Treasurer, I. S. C., Mr. V. M. Srikumaran Nayar, Chairman, Marine Products Export Promotion Council and Director, I. S. C., and Mr. Chas E. Jackson, Executive Vice-President, I. S. C.

of its own. It was decided that the Shrimp Council should aim at an annual shrimp promotional programme to the tune of \$300,000. The actual amount to be appropriated and expended each year will however, depend upon market conditions and industry requirements. Any money not used will be held in reserve for future needs as they arise. It was further decided that the advertisement programme of the Shrimp Council would be formally initiated with funds on hand immediately following the meeting of the Shrimp Council proposed to be held in Mexico City, in June 1967, at which the promotional programme being drawn up would be finally placed for adoption.

It has also been decided that the programme would be administered on the same lines as the programme of the Shrimp Association of the Americas. A Committee would be appointed by the Shrimp Council to supervise the programme and the actual publicity and

advertising would be carried out under contract with the J. Walter Thompson Agency. It is envisaged that with the initiation of the promotional programme of the Shrimp Council, the Shrimp Association of The Americas will discontinue its promotional programme and the Association and its members will contribute funds to the Shrimp Council.

It was generally agreed that the promotion programme of the Shrimp Council should consist of direct advertising; consumer publicity in newspapers, magazines, television and radio; and point-of-sale material and contacts. During the initial stages the programme will cover the United States market; it will be extended to other countries as soon as such a move is found practicable. The promotional programme will be designated as sponsored by the International Shrimp Council and the names of the countries who are its members will be mentioned in the programme.



The Board of Directors of the I. S. C. in session.

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SOME SUGGESTIONS TO IMPROVE OUR FISH CURING INDUSTRY

T. K. Govindan, M. Sc., Dip-in-Tech.,
Central Institute of Fisheries Technology,
Ernakulam.



INTRODUCTION

Curing is by far the oldest, cheapest and simplest method ever adopted for the preservation of fish. Curing includes sun-drying, salting, pickling, smoking, artificial dehydration etc. and in short comprises all the methods of preservation of fish other than refrigeration and canning. As far as India is concerned,

curing of fish has been an important industry and until about a decade back it remained to be perhaps the only method of preservation of fish. As may be seen from the data reproduced below, over 50% of our total landings of fish were preserved by curing till 1959, while only about 6% were consumed by the freezing and canning industries.

	1956	1957	1958	1959	1960	1961
Total landings in million metric tons	1.01	1.23	1.06	0.82	1.16	0.96
% of total landings utilised for curing.	50.8	50.7	50.8	50.7	43.6	43.6
% of total landings utilised as fresh.	42.5	43.1	42.8	42.8	48.0	48.0
% utilised for other processing methods.	6.7	6.2	6.4	6.4	8.4	8.4

The drop in the proportion of fish used for curing since 1959 is partly due to the increased consumption in the fresh market consequent on employing quick methods of transport of fresh fish into the interior markets and partly due to the comparatively larger utilisation of fish by the freezing and canning industries. The drop however is negligible and curing still continues to be the largest single method of preservation of fish in the country.

Present condition of the Industry

Being the cheapest method of preservation, the curing industry has not shown much improvement from its primitive nature. It is manned mostly by people who have not been sufficiently informed of the importance of hygienic handling etc, the preliminary operations of gutting, filletting etc being often performed on the open beach. Even inside

the curing yards much remains to be done towards improving the sanitary conditions. Want of sufficient good water is a big handicap in the curing yards at present. In a survey conducted by the Central Institute of Fisheries Technology, in 1963, 250 samples of cured fish collected from different parts of the country were examined, of which one-third was in a poor condition with yellow discolouration, rancid and putrid smell and attacked by fungus and red halophilic bacteria. Incidentally, it may be pointed out that spoilage in our cured fishery products is almost always found to be the result of either fungal or bacterial attack or both. Insufficient dryage (some samples containing even more than 40% moisture) and insufficient salting have led to quick bacterial and fungal attack. Contamination with extraneous matter was also found to be a major defect. The method of packing and storage of the material also is very unsatisfactory. Baskets made out of coconut leaves are used for packing in Kerala region. In other areas, palmirah leaf mats, cadjan leaves etc are used instead. The packed goods are stored in sheds permeable to insects, rodents and even animals like cats and dogs.

Need for Modernising this Industry

The history of every fishing nation in the world would reveal that fish curing has to stay as the cheapest and easiest means of preservation of surplus fish in spite of the rapid growth of more advanced and effective techniques of processing and preservation. However, the industry can ill afford to remain in its primitive stage of development especially in the face of the growing awareness of hygiene and quality in the minds of the consumers. The situation definitely calls for urgent steps

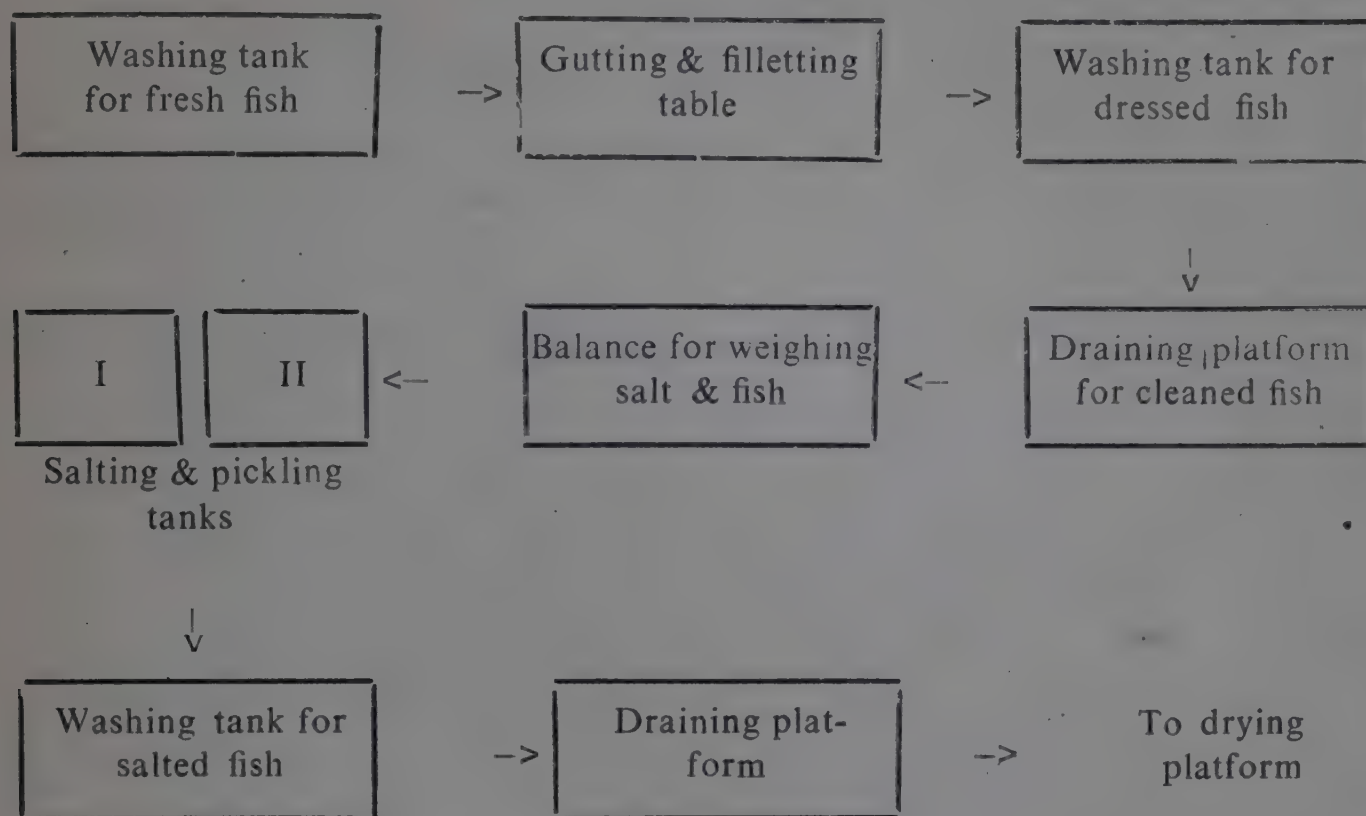
to modernise the industry. Some practical suggestions towards this end are given in the following paragraphs.

A plentiful supply of good, potable running water is a "must" in any fish or food processing plant. Especially in a fish curing plant, water is essential for preliminary cleaning of the fish, cleaning of the dressed fish free of slime, dirt, blood, remnants of intestines etc which is very important for maintaining good quality of the product, for rinsing the salted fish to remove adhering salt which otherwise will form a white incrustation when the fish is dried and finally for the very important step of cleaning the salting tanks and premises after each operation which is quite essential for maintaining hygienic conditions. For this purpose, it is absolutely essential to have an overhead water storage tank with distribution pipe lines to all the curing units.

The curing sheds used at present are of the primitive type and far from satisfactory from the point of view of maintaining hygienic conditions. Hence, these should be replaced by larger sheds with facilities for washing fresh, dressed and salted fish, gutting and filleting the fish, weighing fish and salt, storing salt and applying the salt on the fish under hygienic conditions. The salting and pickling tanks must be either lined inside with porcelain or highly polished with cement preferably provided with a thin lining of stainless steel sheet inside with drain holes. The sheds must be provided with slip proof cement floors with proper slopes, covered with fly-proof nettings and sufficiently illuminated inside, artificially if necessary.

The following is a flow sheet of the different operations which have to be carried

out and the construction of the shed must be so planned that these operations can be performed continuously and without coming in the way of each other.



The gutting and salting tables can be either concrete or wooden with a salt resistant metal top. Sufficient number of taps at the rate of one per washing tank and extra ones with hoses for cleaning the floors, salting tanks etc must be provided. A proper drainage system to lead away all waste water is very essential. A cold storage or at least an insulated room must be provided to preserve the fish in ice until they are processed.

Raised platform must be provided for drying with crow proof and preferably fly proof enclosures. An artificial dryer can also be set up for use in rainy seasons. A smoking chamber also could be provided as we are likely to develop an internal as well as export market for smoked fish products. Good storage rooms with moisture proof floorings and rodent proof walls and ceilings must be provided for storage of the cured fish until it is marketed. Better and hygienic bulk packing materials like plywood or dealwood boxes, polythene lined gunny bags etc. must be utilised. Retail packing must be

done in attractive materials like polythene bags. The processing must be carried out under the supervision of trained supervisors to ensure that the material is handled hygienically, sufficient salt is used and sufficient dryage is effected.

The dry prawn pulp industry also can be brought under this scheme, in which case, facilities for cooking the prawns and deshelling them (mechanical if possible) have to be provided. Arrangements could also be made to utilise the waste from this industry for conversion into fish meal or manure.

The buildings need not be elaborate structures, but small units just sufficient to accommodate the facilities mentioned above. In the case of Government or co-operative yards, many of the above facilities like water supply, storage rooms for salt and fresh fish, drying platform, artificial drying equipment, smoking chamber and storage room for the finished product can be made common, thus saving a lot in the capital investment.

This may not be a difficult proposition because the investment required is quite limited compared to the freezing and canning industries which require complicated and costly items of machinery.

Advantages of modernising this industry

Such fish curing units will facilitate applications of the results of modern research in the industry such as use of chemical preservatives and other additives intended for improving the quality as well as enhancing the shelf life of the cured products. It will also be possible then to exercise strict control over the hygienic conditions by use of detergents and disinfectants, which is practically impossible under the present set up. Details regarding maintenance of such hygiene in fish processing plants have already been worked out by the Central Institute of Fisheries Technology, Ernakulam, and published elsewhere.

The arguments put forth by those engaged in this industry at present when they are advised to use better hygienic conditions like more thorough cleaning of the fish, salting tanks, floors etc. to repair the invariably damaged floors and salting tanks, to use chemical preservatives and better packing materials, all of which involve additional monetary investment, are that they would not get better prices for their commodities even if they do all these and that they would prefer to remain contented

with what returns they get now, rather than take the risk of investing more money into the uncertain trade. This sort of psychological approach of the people engaged in this industry is the actual cause of the present pitiable state of affairs and this can be overcome only by properly educating them.

Future prospects

At present, the major part of our cured fish go to the far eastern countries like, Ceylon, Burmah, Singapore etc. where the prices are comparatively low, probably because of the unsatisfactory qualities and rather short shelf life of our products. Very little of it goes to the Western markets, obviously because they fail to conform to the quality specifications of those markets. Hence, if the quality of our cured fishery products is improved by adopting the methods mentioned above, we can catch good markets outside for these products (including dry prawn pulp) and get attractive returns besides developing a good market inside our own country. In the matter of finding out external marketing facilities for these products, the organisations of the Government of India, like the Marine Products Export Promotion Council, are doing immense help. Let us hope that the magnitude and importance of this industry in our economy will be realised by those concerned and due attention paid to it so that it also will in the near future enjoy the status which our canning and freezing industries enjoy at present.

Australia Introduces Bacteriological Standards for Indian Frozen Prawns

Australia has recently introduced Bacteriological standards for Indian Cooked Frozen Prawns imported in that country according to information available here. The Public Health Authorities of Australia after conducting tests have confirmed the presence of high bacterial densities in the consignments shipped from India.

The order promulgated by the Public Health Authorities of New South Wales have specified the following standards which have come into force from 16-1-1967.

- a) Total plate counts at 37 degrees centigrade must not exceed 250,000 per gram.
- b) Count of E' coli Faecal Type must not exceed 20 per gram.
- c) Count of Coagulase positive Staphylococcus must not exceed 100 per gram.
- d) Salmonella and other Pathogenic bacteria must be absent.

It is understood that the Health Authorities have stated that goods received in conditions

not conforming to the regulations would be destroyed and would not be permitted to be reshipped to the exporters.

The Marine Products Export Promotion Council has advised the exporters not to ship seafoods to Australia unless the goods conform to the requirements mentioned above. The Council has also directed the exporters to send samples of the goods which have already been processed for shipment to Australia to the Central Institute of Fisheries Technology for examination from the point of view of the bacteriological standards enforced by Australia.

The precipitate and arbitrary manner in which the standards were enforced besides causing grave concern all round has exposed the exporters in this country to limitless financial losses. Nay, it has contributed to a crisis in the seafood trade. It must not be forgotten that many shippers had already effected shipments and the goods are afloat; their fate is yet to be known. Yet there are others who have processed the items with a view to shipping them against pending orders. Thus large quantities of goods destined to the Australian market are imperilled.

In the past considerable quantities of cooked frozen prawns were being shipped to Australia and complaints regarding quality were few and far between. Even assuming for a moment that the Australian authorities had reasons for enforcing restrictions, we believe there was no justification whatsoever for taking such a unilateral step fraught with grave consequences to the trade here. We wish the authorities in Australia had consulted the Government of India on the subject before clamping down the order on Indian exporters.

It is clear that in respect of goods that are afloat and in process of shipment the contract entered into earlier had stipulated no such conditions. Therefore, in our view the authorities in Australia should have treated these separately and exempted them from the provisions of the ban. We would, even at this late hour earnestly appeal to them to relax the restrictions in respect of pending orders thus enabling the exporters to fulfill their existing contracts. Perhaps the authorities in Australia would have rethinking in the matter and suggest another suitable date for the enforcement of restriction in consultation with the Government of India.



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Deepwater Prawns and Lobsters Off the Kerala Coast

C. V. KURIAN

(Oceanographic Laboratory, Ernakulam)

[Majority of the prawn catch of the Kerala coast comes from the inshore regions within the 10 fathom line. A bottom deposit formed of fine mud rich in humus is found to be the ideal condition for the penaeid prawns. Similarly the lobster is observed in large numbers at localised areas very near the coast in the crevices of rocks.

Though it has been observed that prawns and lobsters exist in deep water as well under different conditions, our knowledge about these forms along the Indian Coasts is very scanty, being restricted to the works of Spence Bate, Alcock, De Man and Ramadan.

Recently, during the cruises of the University Research Vessel "Conch" off the Kerala Coast (1958-1963) two species of deep water prawns and one species of lobster were collected from depths 100-180 fathoms. Of these, *Penaeopsis philippi* is found in large numbers occupying an almost continuous bed extending from

Anjengo to Mangalore, while *P. rectatus* has a restricted appearance between Cochin and Calicut. However, some sort of year to year variation has also been observed regarding the abundance of the species at various stations.

Peurulus sewelli has a more restricted distribution, the maximum number being found between Puvar and Cochin. Attempt has been made to correlate the occurrence of the species with the hydrological conditions at the bottom and the nature of the substratum. It is observed that *Peurulus sewelli* occupies a more or less hard bed formed of sand with shell fragments or stones and small percentage of silt, the bottom temperature at the stations varying from 11°C to 14°C. *P. sewelli* is a more or less permanent inhabitant of the edge of the continental shelf off the Kerala Coast worthy of attention for detailed investigation with a view to explore the possibilities of commercial exploitation.]

Among the edible crustaceans that are fished from the coasts of India, prawns compose more than 90% of the landings. Along

the Kerala Coast, during certain seasons the prawn fishery is so significant that it forms the bulk of the total catch. But the present

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marine fishery is mostly seasonal and is restricted to shallow inshore regions often not exceeding the 10 fathom line. Though the prawns occur in the inshore waters almost throughout the year, the maximum abundance is observed during the monsoon period June to September. The commercial catch along the Kerala Coast consists of *Metapenaeus dobsoni*, *M. monoceros*, *Penaeus indicus* and *Parapenaeopsis styliфера*.

The sixth session of the Indo-Pacific Fisheries Council at Tokyo held in 1955, while highlighting the importance of the Prawn Fisheries of the Indo-Pacific region, pointed out the potentialities of the exploitation of the offshore resources which have not yet been attempted. Per Sandven (1959) also suggested about the possibilities of rich prawn grounds off the Malabar Coast.

Similarly the lobster fishery of the west coast is restricted to certain localised regions that have a rocky substratum. Along the Kerala Coast only a few species of *Panulirus* are occasionally collected from the rocky coastal areas. Rare catches are sometimes obtained in the trawl nets that fish in the inshore regions. But here also no attempt has been made for the exploitation of the offshore resources.

The previous works on the deepwater prawns and lobsters off the Indian Coasts are very scanty and these deal only with scattered collections by expedition cruises.

In 1958, the Oceanographic Department of the Kerala University started an investigation of the Bottom Fauna and Bottom Deposits of the offshore regions upto the 200 fathom line working at fixed stations from Mangalore in the north to Puvar in the south. Two species of deepwater prawns—*Panaeopsis philippi* and *P. rectacutus* and two species of lobsters—*Puerulus sewelli* and *Palinustus sp.* were obtained. All except the last species were obtained in fairly large numbers and so

a detailed investigation was subsequently carried out for exploring the extent of the grounds. Altogether 150 stations covering an area of about 4800 sq. miles were investigated so far. A 6 ft. beam trawl and a Naturalist's dredge were employed for obtaining the collections. As a result of the above survey, it has been observed that *P. philippi* occurs in large numbers near the 100 fathom line occupying almost a continuous bed, with a maximum intensity between Cochin and Calicut. In the first survey (John & Kurian 1959) it has been found that *P. philippi* occurs along the edge of continental shelf near the 100 fathom line, where the temperature ranges from 16°C to 20°C and where the bed of the sea is formed of fine sand and silt. But, subsequent surveys have shown a shift in the location of the prawns to deeper regions, more specimens having been collected away from 100 fathoms and upto 180 fathoms. Along with *P. philippi*, another species of the same genus *P. rectacutus* has been observed at a few stations, the latter species being less abundant than the former and occupying deeper stations.

During April 1959, in the beam trawl collections off Vizhingom and Anjengo a few specimens of the spiny lobster *Puerulus sewelli* were obtained from 150 and 110 fathoms respectively. The sea bottom in these regions was found to be rocky. Further observations revealed the presence of the lobster towards the south upto Puvar and north as far as Cochin, often occupying a depth beyond the 100 fathoms line. However, slight changes in the location of the lobster bed was noticed during the subsequent surveys. Anyhow, it is evident that *P. sewelli* occupies a bed beyond the continental shelf and it is generally found in a hard bottom formed of sand with shell fragments or stones and small percentage of silt. The bottom temperature in the region varies from 11°C to 14°C and a dissolved oxygen content as low as 0.71‰. It is interesting to note that Alcock (1901) recorded

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the type of the species "Off Travancore Coast" almost from the same locality from where it was collected during the present investigation after 60 years. This further substantiates that *P. sewelli* is a more or less permanent inhabitant of the edge of the continental shelf, off the Kerala Coast worthy of attention for detailed investigation. Though the maximum number of specimens obtained in a 10 minutes' haul by the 6ft. beam trawl is only 30 (Off Anjengo, 1960), later off Alleppey at 180 fathoms, more than 50 specimens were obtained in the otter trawl operated at a bottom of fine grey sand with small percentage of silt. From the above survey it may be deduced that *P. sewelli* occupies a rocky as well as sandy ground with small percentage of silt.

An attempt was also made to study the food and feeding habits of a few penaeid prawns. Most of the species feed on what is readily available. Hall (1962) observes that some species select their food with preference for a carnivorous diet, while others feed mainly on vegetable matter. Panikkar and Menon (1956) observe that prawns feed on detritus of both plant and animal origin and along with it large quantities of sand and mud. Hall *loc. cit.* is of the opinion that "detritus" could be considered only as a very minor item of the diet and that penaeidae in general cannot be considered as detritus feeders and that prawns feed on living or dead animals.

Analysis of the gut contents of *Penaeus indicus* and *Metapenaeus dobsoni* collected from the inshore regions of Kerala, showed remains of crustaceans, foraminifera, diatoms and detritus, the last one being more prominent. On the other hand the gut contents of *P. philippi* and *P. rectacutus* collected from the deep water regions showed a different characteristic. Detritus formed only a very minor part, while the predominant elements were foraminifera, crustacean appendages, Decapod larvae, Isopod and very rarely diatoms and stand grains. This change in the dietary may

be due to the difference in habitat. While *Penaeus indicus* and *Metapenaeus dobsoni* occur in the inshore regions at a muddy bottom, *Penaeopsis philipi* and *P. rectacutus* occupy a deep water region having a more or less hard sandy bottom with only a small percentage of silt. The occurrence of *P. philippi* and *P. rectacutus* in the offshore areas, perhaps may also be due to their special preference for the type of food available in that region besides the hydro-graphical conditions prevailing there.

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(Symposium issue)
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bounty
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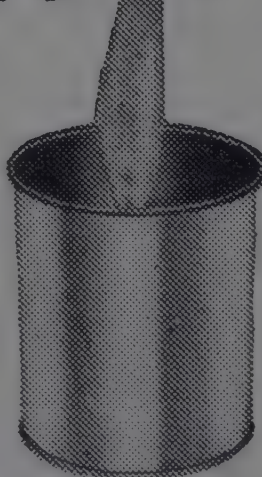


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DRY FISH EXPORTS TO CEYLON

Channelising through State Trading Corporation suggested

Recently the Government of Ceylon nominated ten exporters in India to export dry fish to Ceylon, in total disregard of the existing trade agreements with the Government of India and the Marine Products Export Promotion Council.

Taking into account the fact that there are now as many as thirtyfive exporters who have been regularly supplying dry fish to Ceylon, the selection of only 10 out of them was apparently done by the Ceylon authorities in an arbitrary way.

At a meeting of Dry Fish Exporters' Panel held at Tuticorin on January 26 it was unanimously decided that the exports of Ceylon should be channelised through the State Trading Corporation. It was pointed out that the Co-operative Wholesale Establishment of Ceylon was a monopoly buyer for that country and it was, therefore, meet and proper that India should also assume the role of a monopoly

seller at State level.

In accordance with the decision of the panel meeting Messrs. V. M. Sreekumaran Nair, Chairman and Kurwath Damodaran, Vice-Chairman respectively of the Marine Products Export Promotion Council, Ambrose Fernando, President, Fish Exporters Chamber, Tuticorin and other important representatives of exporters waited on Shri Manubhai M. Shah, Union Minister for Commerce, at Madras on January 31. The Minister agreed to the suggestion for channelising the exports through the State Trading Corporation. The Government of India has also issued a notification to that effect.

At a subsequent meeting held at Tuticorin in which the State Trading Corporation officials and the exporters participated, it was resolved to send a delegation to Ceylon led by the Chairman of the Marine Products Export Promotion Council to negotiate with the Government of Ceylon the relative terms and conditions.

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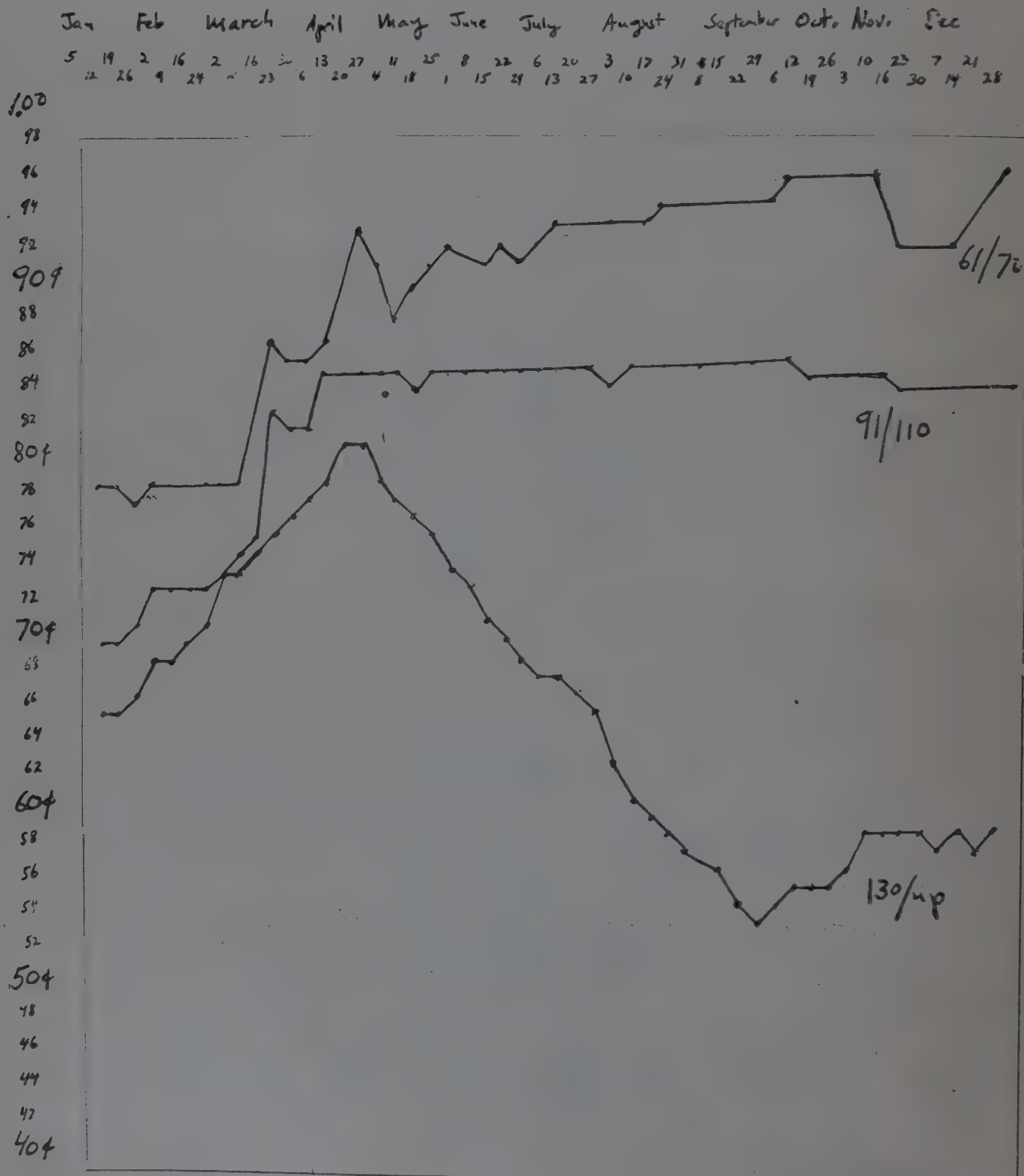
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BLOCK FROZEN INDIAN SHRIMP — 1966



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— FROZEN SHRIMPS

1966 happened to be a strange year for the Shrimp market.

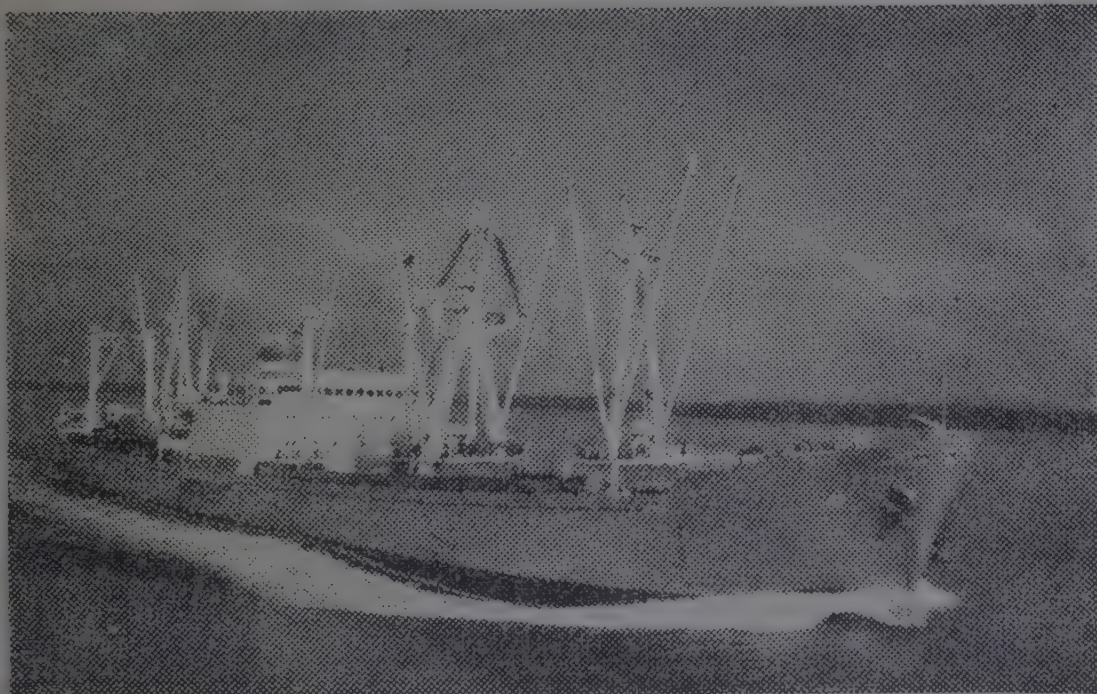
Although all the sizes tended to move together from the beginning of January through the middle of April, the 130/up proceeded from middle of April on to follow a completely independent course. A severe drop in price started late in April for the 130/up and this continued until the middle of September and resulted in a nearly 30 cents a pound drop in price. After hitting the low point in late September, prices then rallied slightly and the last eight weeks have seen very steady prices at around 60 cents a pound.

The 91/100 and 61/70 rose for the first

third of the year, and then continued rather steady until the end.

Supplyposition at the end of the year is tight in the United States and the prices are expected to be firm at least through February. Although shell-on, headless shrimp were weak for some time, they seem to have gathered some strength. All sizes and all types are expected to be strong until the end of February, though perhaps the smaller sizes peeled and deveined shrimp will show the greatest gain in price.

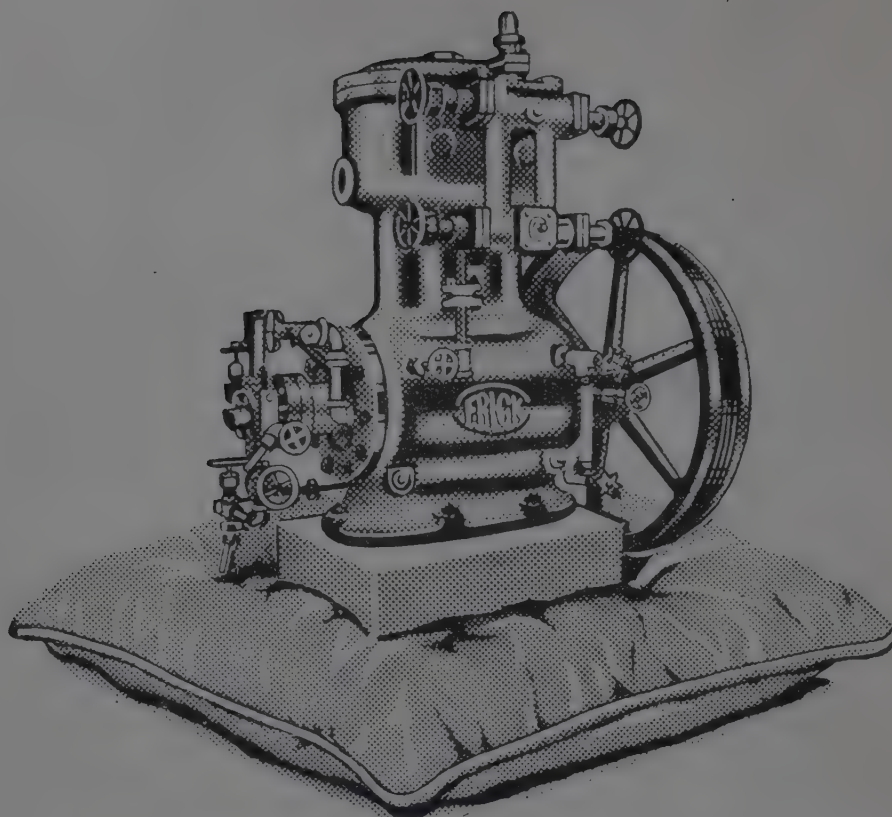
The chart on the facing page shows the rise and fall in prices recorded in U. S. A. market during the year 1966.



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During the Fourth Plan Period a sum of Rs. 15.25 crores (Rs. 12.50 Crores in the State Sector and Rs. 2.75 Crores in the Central Sector) is proposed to be invested in Kerala for the development of fisheries.

A break-up of the allotment indicates that a sum of Rs. 5,15,60,000 is for mechanisation of fishing, Rs. 1,06,00,000 for imparting technical education to fishermen's children and Rs. 1,20,00,000 for fish processing, transport and ice and cold storage plants. There is a provision of Rs. 20,00,000 for housing schemes for fishermen at some of the fishing centres selected from places like Baliapatam, Cannanore, Tellicherry, Quilandy, Calicut, Beypore, Azhikode, Cochin, Vizhinjam, Neendakara etc. A sum of Rs. 25 lakhs has been set apart for starting centres at Cannanore, Beypore, Ernakulam and Vizhinjam for fishermen to train them in the handling & maintenance of mechanised fishing vessels and for starting junior technical schools at Baliapatam, Ernakulam and Vizhinjam for fishermen's children with lower secondary education. A

sum of Rs. 40 lakhs has also been provided for building roads and supply of protected water. While a sum of Rs. 20,00,000 has been set apart for research and statistics, a scheme for the supply of vitaminised food to children and expectant mothers among the fishermen population estimated to cost Rs. 6,00,000 has also been included. Employing twenty mechanised boats distributed among ten fisheries co-operatives at Vizhinjam, Puthenthope, Neendakara, Ponnani and Cannanore, it is proposed to distribute ten percent of the catches among children and expectant mothers under the vitaminised food supply scheme. This scheme is already under way. The Central Fisheries Corporation will receive a sum of Rs. 34 lakhs towards its share capital and the State Fisheries Corporation will be given financial assistance to the extent of Rs. 2.30 crores. A token allocation of Rs. 5 lakhs is proposed for a boat-building yard for the construction of large steel hull fishing boats with foreign collaboration sanction for which has been accorded by the Central Government.



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Last year the artel received an income of 2,200,000 rubles. Every fisherman earns an average of 240–250 rubles a month. Their houses are roomy and well-appointed. The artel built itself a boarding school, a fine club complete with library and concert hall, a kindergarten and a nursery.

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All Time Record for Marine Products Exports

Exports exceed 135 million Rupees in 1966

Exports of Marine Products from India during 1966 have touched an all time record figure. The export earning during the year rose to Rs. 13.52 Crores which is 6.60 Crores (95%) over that of the previous year. Prawns accounted for a major share of exports followed by

Dried Fish, Frozen Froglegs, Lobster Tails and Sharkfins etc.

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NEWS & NOTES

Arista Industries Inc. New York.

Mr. Edward Rivlin, President of M/s. Arista Industries Inc., leading Seafood importing firm of U. S. A. visited Cochin during the 2nd week of December and had discussions with various exporters shipping Frozen Seafoods to his firm in New York.

Kerala Seafoods

Kerala Seafoods, Neendakara, have commissioned their new Freezing Plant constructed at Neendakara near Quilon.

Fisheries Development in Mahe

Mahe, a tiny area, situate on the Malabar Coast and being administered by the Government of Pondicherry State has been allocated a sum of Rs. 11,65,000 for Fisheries Development during the fourth plan, it is reported. Out of this a sum of Rs. 9 Lakhs is earmarked for the construction of 40 Mechanised fishing boats and Rs. 1 Lakh for the supply of fishing equipments at subsidised rates.

Kerala Fish Catches

Catches of fish in Kerala during 1965/66 were 2,155,528 Metric Tonnes valued at Rs. 549,02,215, it is reported.

Fishing Boat Building Yard for Laccadives

Kavarathi in Laccadives has been selected for locating a fishing - boat construction yard

for the group of Islands. The yard will be capable of building ten fishing boats at a time.

U. S. A. Shrimp imports up in October*

After keeping pace with a year ago through July, imports of shrimp surged upward during the months of August-October to set a record for each of these months. October receipts were estimated at 23 million pounds, the largest quantity ever entered in a month. Total imports for August - October were 50 million pounds - 28 percent more than last year. For the year through October, 141 million pounds entered, about a tenth more than last year.

F. A. O. World Scientific Conference on Shrimp and Prawns *

The F. A. O. World Scientific Conference on Biology and Culture of Shrimps and Prawns will be held in Mexico City from June 12 to 24, 1967.

Fish Consumption in Russia

In Russia, a family of 4 members on an average consumes 3 Kgs. of fish per week, according to a report.

* Shrimp Abstracts.

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SEAFOOD EXPORTER

VOL. 1

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FEBRUARY '67

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No. 10

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Editor.

FOR several decades now Ceylon has been the principal buyer of India's dry fish. Economic exigencies, in that country, however, necessitated changes in the pattern and method of handling this important trade. As a consequence the Wholesale Co-operative Establishment came into being in Ceylon a few years ago. With the resultant monopoly enjoyed by it began bad days for the dry fish export trade in this country. From time to time the Establishment unilaterally imposed restrictions in respect of price, quality inspection etc. which from the point of view of exporters in India were unreasonable in character. These problems were accentuated by the inordinate delays experienced by exporters in realising payments for the goods. All these vexatious factors besides the uneconomical nature of the transactions themselves inevitably forced many exporters out of the trade. Yet, some of them continued their exports hoping that the situation may improve sooner or later. Contrary to expectations conditions in the long run instead of improving began deteriorating rapidly. Matters reached a climax when recently buyers in Ceylon arbitrarily decided to deal with only 10 out of about 35 exporters in this country in contravention of the terms of the trade agreement existing between India and Ceylon. So sudden was this decision that neither the Government of India nor the Marine Products Export Promotion Council were aware of such a development fraught with grave consequences to the exporters.

The Exporters hastily met, took stock of the situation and thoroughly discussed the matter. The consensus of opinion among them revealed that they were not prepared to oblige the C. W. E. who wanted a majority of even the existing exporters here to be eliminated from the trade. It was unfortunate and regrettable that the monopoly buyers in Ceylon should have ignored the interests of exporters in this country. As a countermeasure, therefore, it was suggested that exporters in this country should also channelise their trade through the Government-owned State Trading Corporation. Accordingly, a decision to this effect having been taken, the Marine Products Export Promotion Council and the Government of India were approached. Since then

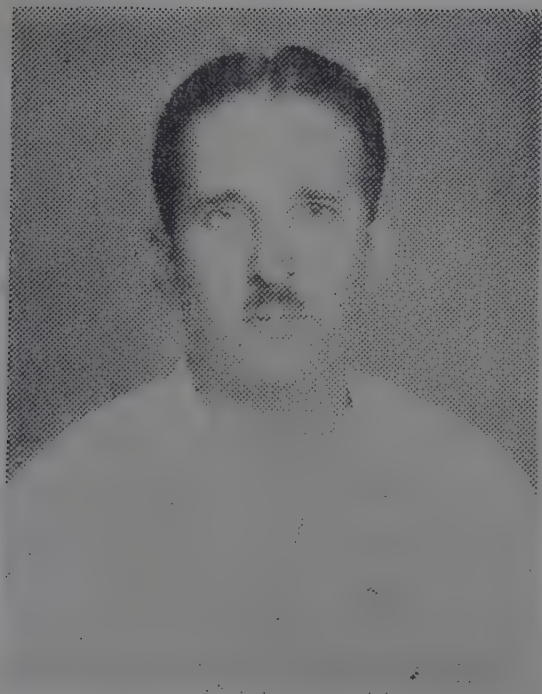
the Government of India has issued a notification channelising the exports of dry fish to Ceylon through the State Trading Corporation.

It is significant that thus, a Government Agency in this country has entered the export trade with monopoly to export an important item of Seafood. We have all along been raising our voice against Government entering the Seafood export trade. However, in this specific instance it was obvious that quick, firm and effective steps on Government level were called for. It had to be borne in mind that Ceylon is the only buyer of this commodity. The fact that there was no alternative outlet for India must have induced the importers in Ceylon to take far-reaching steps detrimental to the interests of exporters in this country. On the other hand exporters here, conscious as they were of all the disadvantages they were subject to, were exercising considerable patience and reconciling themselves to the prevailing circumstances. It was at such a time that Ceylon's latest decision to recognise only 10 exporters came. This, the exporters found, could under no circumstances be accepted. Viewed in this context, therefore, the decision to channelise exports through S. T. C. could only be taken as a necessary evil. At the same time, according to reports, the S. T. C. will only act as monopoly agent for the exporters who thereby do not stand to lose any of the benefits hitherto enjoyed by them under the export promotion schemes etc. Since the STC is entrusted with the task of assisting exporters without interfering with their normal trade activities there can be no ground for the fear that it would displace private enterprise. However, the STC's performance in this respect would be watched with keen interest and we trust it will act only in a manner justifying the confidence reposed in it by the exporters. In this task, therefore, we wish the STC well.

Even so, we feel that the dry fish trade should not in future be allowed to hang on the whims and caprices of buyers in a particular Country. We had the instance of Burma with whom our trade in Dried Prawns has come to a standstill. Now a situation may soon arise when it may be impossible for our exports to continue with Ceylon. In order to overcome such difficulties alternative markets have to be found. We urge that the Government and the Marine Products Export Promotion Council should lose no time in taking steps in that direction.



FISHERIES IN KERALA



M. DEVIDAS MENON

*(This is the first of a series of Articles by the author
who is the Director of Fisheries in Kerala State)*

I. ECHOES FROM THE CORRIDORS OF TIME

1. The Fishing industry of Kerala has a hoary tradition. Scattered evidences of the immensity of its fisheries, the largeness of its fish trade and the importance of the fishing community in its social structure are found in the songs of the Sangam age (i. e. 1st to 4th Century A. D.), and in the diaries and records of travellers to India like Pliny and the anonymous author of the 'Periplus of the Erythraen Sea', both of whom wrote in the 1st Century A. D. In his book 'the elements of South Indian Palaeography' Dr. Burrell stated that Agriculture was the chief occupation of the people in the Sangam Age. 'The land was fertile and there was plentiful supply of grain and fish.' Again Prof. P. N. Kunjan Pillai in his 'Charithrathinte paschathalathil' writing about the high position and maximum freedom

in society which women enjoyed in those golden days' notes that 'a considerable number of women engaged in the sale of fish'. Trade in fish in those days was brisk and Muziris was the "important port, the 'primum emporium Indae' where, as Pliny records, 'the Phoenicians, Egyptians, the Greeks and Romans each in turn carried on a lucrative trade with Kerala'. Their ships often called at the port of Muziris and sailed back with such articles as Sandalwood, Ivory, Apes, Peacocks, Pepper, Pearls, Tortoise shell and other marine products.

2. The works of classical writers and Tamil poets are replete with references to the unrivalled commercial prosperity enjoyed by Muziris in the days of Roman trade. One poet says 'fish is bartered for paddy which is brought

in baskets to the houses" (1) 'The gold received from ships, in exchange for articles sold, is brought on shore in barges at Muchiri, where the music of the surging sea never ceases and where Kuttuvan (the Chera king) presents to visitors the rare products of the seas and mountain" (2).

After the Sangam period, the next important period in the fish trade in Kerala was the age of Kulasekharas ile. the 9th Century A. D. During this period the trade had shifted from the European Countries to one with the Asian and African countries. Sulaiman, the Arab merchant who visited South India in 851 AD. recorded that the Chinese were the most important foreigners who traded with Kerala then. The important commodities which were exported from Kerala contained Pearls, Tortoise shells and other marine products. The enormous increase in the volume of international trade brought in its wake increasing prosperity to the people. A number of important merchant guilds or trade corporations functioned in all major towns. (3) The most notable of these merchant guilds were Manigramam (dealing in pearls and diamonds) and Anjuvannam. It is believed that one of the fine commodities traded by Anjuvannam was fish.

3. FISHERIES

The people exploited the fishery wealth in the backwaters and the inshore seas fully. The fishermen used many ingenious methods for fishing. The catches from the seas were very large.

Nicolo Conti, the Italian traveller who visited Cochin in 1440 A. D. gave the following

-
1. E. H. Warmington — "The commerce between the Roman Empire and India."
 2. Paranar.
 3. Progenitor of the present day Export Promotion Councils.

account of the fishing with Otters in the backwaters and rivers of Cochin. "The city is 10 miles in circumference and stands at the mouth of a river from which it derives its name. Sailing for some time in this river he saw many fires lighted along the banks and thought they were made by fishermen. But those who were with him in the ship exclaimed, sailing, 'Icepe! Icepe!'. These have the human forms but must not be called either fishes or monsters which issue from the water at night collect wood and provide fire by striking one stone against another, ignite it and burn it near water; the fishes attracted by the light swim towards them in great numbers, when the monsters who lie hid in the water, seize them and devour them. They said that some which they had taken, both male and female differed in no respect as to their form from human beings'. Fr. Odoric in 1320 A. D. observed that 'there are many fishes in these seas that come swimming towards the said country in such abundance that for a great distance into the sea nothing can be seen but the backs of fishes, which, casting themselves on the shore, do suffer men for the space of three daies to come and take as many of them as they please'. Niehoff recorded in 1673 that the sardines were employed for manuring. Dussumier about 1827 observed that they were employed for manuring the rice-fields and cocoanut trees but were too fat to serve well.

4. Kerala had been the melting pot of various cultures. Spices and pepper had brought navigators, trademen and galleys from the different corners of the world. The Assyrians, Babylonians, the Phoenicians and Polynesians before Christ, the Egyptians, Arabs, Chinese, Portugese, Dutch, French and the English after Christ—all came with their crafts and craftiness, skills and ills — all came and got melted in the cauldron of adaptation and adoption in the land — all leaving some thing of theirs in the life, trade and crafts of this country. This is seen in the fisheries sector also as in any other

field. Though the dug out canoe, the major fishing craft, was uniquely of indigenous origin and design, several improvements on it were brought about by the influence of many of the foreigners. The high board dugout, made by additions of planks stitched to the dugout, is purely of Arab influence. The catamaran was of the Egyptian influence. The long snake boats, though not used for fishing, was of phoenician origin in the same way as the cargo lighters were of Arab infiltration in designing. In fishing, the 'Bush Method' had a trace of Egyptian influence in it. The cross bow used in Malabar extensively is purely of Portuguese design and origin as its vernacular name 'parangipathi' denotes. The shore seines (Rampani & Kampavala) also are of Portuguese import. The boat seine, especially the Odamvala and Kollivala are entirely of Spanish influence as they strongly include in them the design and operational methods involved in the Mediterranean lampara. The stake nets had their origin in the stownets of Belgian and German tidal flats imported to Kerala by the Dutch. The Chinese dip net and the Changalapachil Changadam (lure fishing) were imported by the Chinese and infused into the Kerala fishing methods. A word of historical correction is necessary with regard to the Chinese dip net. Hornell (1938) was very categorical that the Portuguese introduced the 'Chinese Dip net' to Cochin after having seen to what effective purpose the Chinese put this particular net in the mainland China. He based his argument on the point 'that the technical terms in use in Cochin for the principal parts of this complicated fishing engine are of Portuguese derivative, often mutilated and corrupt but still recognisable'. Brandt (1964) also subscribed to the same view. I do not think that Hornell and Brandt were correct in their assessment. The Chinese dip net has till recent times been absolutely confined to the region between Azhikode and Quilon. Though we find that there are very good places

in Beypore, Elathur, Dharmadam (Tellicherry), Baliapatam, Madai, Kasergode and Mangalore and even Goa for the operation of Chinese dip nets, we do not meet with them in any of these places and yet they were once strongholds of the Portuguese during their palmy days. On the other hand, the trade with China had been in existence as early as the 2nd Century A. D. and during the 5th Century and 6th Century A. D. there were very populous, prosperous and flourishing settlements of Chinese in Quilon, Cochin and Azhikode (Muziris of old) and we find Chinese dip nets in all these places. Further, the technical terms of Portuguese derivation for the various parts of the net which Hornell found are purely confined to Cochin. In Quilon the names for the various parts are of purely Malayalam origin. Had the net been of Portuguese introduction, a decision arrived at by derivation of terms for the parts, then the same terms should have been absorbed at Quilon also. It is possible that due to the concerted and concentrated influence of the Portuguese at Cochin, many of the terms took a Portuguese derivation over a period of years as happened with regard to many things in Cochin including the names of persons. The screen barriers with traps used in small canals in the Baclad type of prawn fishing in Cochin are also derived from the Portuguese.

5. Just as the various foreign visitants to this State introduced in the fishing sector many of their skills and implements, Kerala also contributed many things to the outside world. The wide dispersal of the designs of the cast net and the blow gun to the outside world has been Kerala's distinct contribution to World Fisheries. The principles of stitching planks with coir rope in boat construction and the application of fish oil as preservative of the timber of boats used vastly in the Arab and Egyptian waters are Kerala's contribution.

6. THE KERALA FISHERMEN:-

Their Decline

The contribution of the fishing community to the culture and life and administration of Kerala has been of no mean import. 'During the Sangam Period, the most distinguishing feature of Kerala society was its freedom from rigid caste and communal barriers. Society in the Sangam Age was organised on the basis of the principles of Social freedom and equality. All occupations were considered respectable and no person was regarded as inferior in the social scale on the ground of having had to follow a particular occupation. Dignity of labour received universal recognition. Those who toiled most were respected most' (1). The toiling classes like the Mukkuvas and Arayans occupied a high status in society--in fact the highest in society according to K. Ramunni (1957) (2), one of the most fanatical of the believers of Araya supremacy. He goes to the extent of claiming that the Cheras and the Pandyas were of the fishing class and that the word "Araya" is only a derivative of the word "Arasar" meaning of the 'ruling class'. While wishing not to enter into any controversy on this question, it has to be pointed out that Cheran Senguttuvan, the greatest of the Chera emperors had as early as the 2nd Century A. D. carried out a very successful warfare on account of which he was also known as 'Kadolottiya Vel Kelukuttuvan'. Parinar, the most eminent of the Sangam Poets calls him 'the Paradava (Sailor or fishermen) on the cold sea who established undying fame by going on the sea and fighting with it' (A taste of old Canute of later fame

in colder climate). Many of the later scholars do not give any credence to this 'naval war' but claims it to have been a simple sea-festival. Be it a naval war or a sea-festival, it remains that Senguttuvan, the emperor, was closely connected with the sea and it is more than possible that he was of the fishing class. This strong Araya aroma in the society of the golden age seems to pervade in subsequent climes as well in much lighter dosage. The aroma is there in the design of the temple standard with its forked tail end and eyed head end and festoons reminiscent of the fins of the finny tribe, in the right of the Araya to present salt and rope to the Rulers of Perumpadappu (Cochin), the rightful descendant of the Chera before crowning, in the playful hunt for fish in a small bowl vigorously pursued by a newly married couple in the Namboodiri Community as a part of the wedding rites--all these continue to reminiscise the strong influence of the fishing folk in the social structure and custom of Kerala from the dawn of history. After the Sangam period there was a period of 'historic midnight' which was followed by the age of Kulasekharas. By the beginning of the 5th Century A. D. the Aryans had begun to spread their stifling tentacles of social influence over extensive areas of South India especially amongst the upper classes. The caste system began to take deep roots in the soil. With this the members of the toiling class like the Panas and fishermen began to lose their positions in the society and administration. By the time of the rise of Kulasekhara the influence of Caste system had become so deep that 'human labour came to be regarded as lacking in dignity. Just as the dietary habits of the people determined their status and caste to a certain extent, the nature of their occupation also came to be regarded as

1. A. Sreedhara Menon, (1962), Kerala District Gazetteers — Trichur.

2. K. Ramunni, (1957) Pournika Meenavanmar (Arayanmar).

a decisive factor in the determination of caste and status. The more a person worked, the less was now his status in society'. (Sreedhara Menon 1962). The early Kulasekhara's period (i. e) 800-900 A. D.) was an enormous increase in the volume of international trade which brought in its wake increasing prosperity to the trading class. The rich became richer and social divisions took a further and finer rearrangement based on wealth. Added to this there was the hundred years of Chola-Chera war, which brought in its wake the Namboodiri Age and its attendant Jenmi system. Jainism and Buddhism lost even the remnants of their assuaging influences. The evils of untouchability and unapproachability became the rule. An economic stagnation and chaotic condition in society followed, which has remained the hall marks of Kerala ever since. Men with property and money alone wielded power and position and in this manner, the toiling class of fishermen slid further to the bottomless pit of social stigma and ostracism to become one of the 'lowest, lowliest and lost' of the community. The only position we find them occupying during the period was as the workers in the huge and powerful navy which the Kulasekharas had maintained. Ma Huan's description in 1409 A. D. sums up so vividly the utter penury and tragic status of the fishermen in the society of those times: 'In the fifth class are the Mukkuvas, who are the lowest and poorest of all. The Mukkuvas live in houses which are forbidden by the Government to be more than three feet high, and they are not allowed to wear long garments; when abroad, if they happen to meet a Nayar or a Chetti, they at once prostrate themselves on the ground and dare not rise until they have passed by; these Mukkuvas get their living by fishing and carrying burdens'. And this in

ten centuries to happen to a community that was at the helm of affairs in the State and that had once at its helm the great Emperor Senguttuvan'!

7. After the Kulasekharas came the deluge of the western domination by the Portugese, the Dutch and the English. During the days of Portugese supremacy, the fisher-folk was subjected to heavy proselytisation. They introduced many new innovations in fishing like the stake nets, the Spanish lampara, and the Portugese shore seine.

It was perhaps the Dutch who, for the first time with their typical eye for organisation and method in trade, made some attempts at introducing a system in fishing and fish trade. It was they who introduced certain restrictions on fishing in the backwaters to preserve and conserve stock. Fishing in the extensive backwaters was restricted to one of fishing with license and a small fee also was collected. Occasional qualms of conscience also seem to have influenced the more liberal hearts of the Dutch to pay some attention to improve the economic status of the fishermen. During the 18th century, when a famine struck the coastal strip from Cranganore to Chettuvayi, the Dutch imported improved seeds of indigo from Surat and entrusted the Mukkuvans (fishermen) with its cultivation, possibly to improve their economic condition. With the coming of the British the fishing industry and community declined further. Though the British came to India as traders, they stayed to conquer and rule. The administration of the British was one of disregard of the social welfare of especially those communities that were involved with natural produce. The various fine fishing harbours became silted up by default and lack of attention and maintenance, hastened by soil erosion as a result of the fast deforestation. The boat-

building industry for which Kerala was famous dwindled very much. When the rest of the world marched fast in the flush of new technological knowledge, the fishing industry in Kerala stood by untouched by all these. As the world bypassed Kerala, its fishing industry stood still and on the eve of independence it was primordial in comparison. Yet in this pathetic picture, there were a few British administrators like Francis Day, Edgar Thurston, Frederick Nicholson and James Hornell who with larger visions and wider scientific outlook, made some sporadic yet detailed studies on the status of fishing industry and its possible lines of development. The periodical reports

of these '*paranoids* in the British Administration' (as self-defined by Hornell) were more often than not consigned to cold storage. To quote Hornell on the fate of one such report: 'This report in due course is commented upon sagely by youthful undersecretaries whose *dicta*, almost invariably adverse, are usually endorsed by Government in the orders passed on the report. The primrose path in the circumstances is agreement with opinions that entail no struggle with the treasury authorities. Thereafter the report is printed and consigned to oblivion in the official archives'. This was the picture of the Fishing Industry in Kerala on the eve of Independence.



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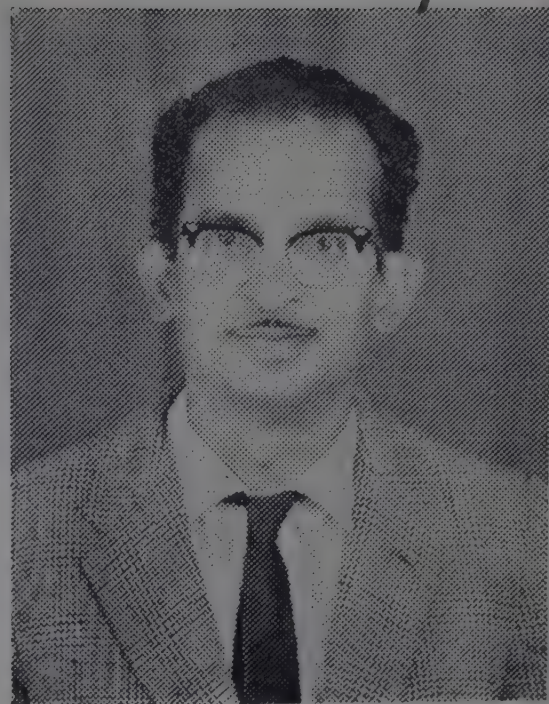
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OUTLOOK FOR FISH PROCESSING INDUSTRY IN INDIA



Dr. S. V. Suryanarayana Rao, M. Sc., Ph. D.; (Hamburg),
Senior Scientific Officer,
Central Food Technological Research Institute, Mysore - 2

JUDGING from the progress achieved in the past few years, one finds an assurance that the fish processing industry on modern lines has come to stay in India. As index of the rapid phase of development is provided from the fact that the canned and frozen marine products have displaced traditional items like salted and dried fish to secondary importance among the exported commodities. There has been a remarkable increase in the export of frozen and canned shrimp in recent years. Foreign exchange earnings from Marine Products amount to 135 million Rupees. It is a heartening feature that the bulk of these exports are to the hard currency area. While we can expect a further expansion of the shrimp industry, there is also a real need for stepping up export of cured fish whose exports have declined in recent years, to 1959 level. This would particularly help in the promotion of regional trade. There is moreover scope for further expansion of export trade in other items like fish oil, fish meal and other marine products.

Apart from export promotion, fisheries development is necessary even for internal consumption in view of the low level of fish consumption in India and the need for improvement of the protein nutrition of the people. It has been estimated that a minimum of 4 million tons is needed for the optimum nutrition of the existing fish eating population alone. There is however, great scope for increased catches in the coming years by introduction of mechanised vessels, improved nets and more efficient methods of fishing. The fish processing industry has therefore to think ahead and take recourse to latest methods of processing for efficient distribution and utilisation. It is however necessary that a proper assessment of the objectives of the industry is undertaken to channelise our efforts into constructive lines to derive the maximum benefit. It is quite obvious that fisheries development requires a close co-ordination between the centre, states and the processors and traders. Although much of the development would involve a mere application

of the existing knowledge, research is still needed to modify the techniques to suit Indian conditions or to tackle problems relating to any particular region. Toward this end one has to identify the problems involved correctly to initiate scientific research projects on fruitful lines. Research organizations have to orient their working to the actual needs of the industry as it exists or industries likely to come up in the near future. It is also incumbent on the part of the industry to show greater awareness of the technological aspects of processing, employ qualified scientific personnel and take advantage of the latest developments in their field. Such an enlightened approach on the part of the industry can greatly enhance the quality of their products and help in stabilising their markets.

Although pessimists are not wanting in India who doubt the need for food processing under Indian conditions, there is a clear case at least in the case of marine fish, bulk of which is landed on the West Coast and which needs some form of processing or other to reach the consumer. More over, in view of their highly perishable nature, fish require scientific methods of handling. Of course, one has to broaden the definition of fish processing to cover all aspects of handling in the marketing of fish. One must also remember that processing need not involve large scale plants and there is room for smaller units. Mechanisation need not be the sine qua non of the industry, since the position of under developed countries like India is very much different from other advanced countries. A certain amount of centralization is no doubt needed or otherwise beneficial for grading, packing, refining and sales promotion in inland and foreign markets. In some cases, the development of the fish processing industry may not involve any radical changes in the traditional methods but only call for application of scientific principles instead of relying on tradition. There is a good deal of apprehension in India regarding the market for processed foods; in view of the heavy require-

ments for capital investment. Reasonable assurance of a ready market is of course needed for starting any industry. But, market development very often requires some initiative and imagination to visualize a potential market and one should not feel circumscribed by the existing needs alone.

As for markets, one has to look for them and start some preliminary surveys among possible consumers. In many of the advanced countries, Defence needs offer a steady market to many of the industries. It might be possible to supply the army with canned, dehydrated or pickled fish. Each of these products offer special advantages irrespective of the cost considerations. It was observed for instance that salted fish could be preserved indefinitely under brine if a little of preservative is added. They could be desalted and dried if needed for easy transportation. As another example, it would be more easier to popularise novel products like smoked fish among the defence personnel than in the civilian market. Although smoked fish is popular all over the world, they are not relished in India but the present writer has shown that oil sardines can keep free from rancidity for two to three months in the smoked condition. Their shelf life may perhaps be extended by improved methods of packing and storage. Markets can also be explored in case of cheaper products like cured fish in remote localities like plantation areas, new industrial townships and plan project centres. At present new industrial townships put an undue strain on local food supplies and the resulting inflation is sometimes offsetting the benefits accruing to the people of the area. Directorates for foreign trade are also being set up in recent years.

Another controversy deals with the limited market for processed foods in India which is confined to the well-to-do strata and fails to reach the common man. While the improvement of the common man's nutrition is no doubt important, it is also necessary to promote industries catering to special sections of the

population provided a demand is established because one of the objectives of fisheries development is to provide higher returns to the fisherman himself. More over, any new industry contributes to national economy, offers more scope for employment and brings over all benefit to the country at large.

With this background in view, let us examine the scope for fish processing industries in India. Notwithstanding the progress made in freezing and canning, fish curing needs the greatest attention since the bulk of the fish marketed in India is still cured by traditional methods. Although these might ultimately be replaced by more modern methods, salted and dried fish are the only means through which fish can reach the poorer consumers in interior markets. In spite of the prejudice against cured fish because of their existing low quality, research work in recent years has indicated that their quality can be greatly improved and shelf life prolonged if the methods are standardized. It was observed during a detailed survey of the curing centres all along the coast that the existing state curing yards are quite out-dated and do not serve the present day needs of the industry. Improved design for a better type of a more compact and modern curing yard has been finalised by the present writer. Defects of the existing product were found to be the high moisture content, insufficient salting and sand contamination. If moisture level is kept below 35%, more salt is employed and contamination with sand is avoided by drying on erected platforms. Cured fish also should keep well. One of the essential problems is the design of proper drying sheds to prevent case hardening by direct exposure to the sun. Optimum salt is also beneficial on other considerations. It was found in a survey of the Orissa State that insect infestation can be controlled by proper salting. There is scope for further improvement by using chemical preservatives. Propionic acid dips were found effective in case of salted mackerel. The CFTRI has also evolved a special salt mixture containing suitable chemical

preservatives. Up to one ton of mackerel has been processed by this improved method and the results are quite encouraging. Although the cost aspect has not been fully worked out it looks as though the extra cost involved may not be more than 5 to 10%, over the present level which is more than compensated by the better quality and longer shelf life. Special emphasis on such lines is needed in case of the products for export markets and extra cost if any may be adjusted by supply of subsidised special salts, chemicals or concessions in export duties. Quality control measures are greatly needed at least in the case of exported products.

In some cases even minor improvements on scientific lines can alter the existing situation. As an example, methods based on pickling along the West Coast by holding heavily salted fish under saturated brine show heavy mould growth, reddening due to halophiles and even maggot infestation actually observed at many centres. Such spoilage can easily be controlled by incorporation of a small quantity of propionic acid in the brine. In some of the traditional methods, the underlying principles may be quite sound but the same result can be achieved by other means. Pit curing or burying salted fish packed in mats for varying periods in the sand, is practised widely on the Madras Coast. Although the products are delicious and quite popular, Maggot infestation is very prominent in the existing method and the process has been virtually banned in State curing yards. However, the same result viz. incubation under semi-anaerobic conditions at a slightly elevated temperature can be obtained by evolving a more hygienic technique on scientific lines. Methods of packing cured fish deserves a serious study in view of the high humidity levels prevailing specially in coastal areas. Development of proper containers, inexpensive and capable of local fabrication, packing in inert atmospheres like N_2 and still cheaper methods like in-package desiccation requires some attention. Importance of the proper methods of storage is evident to any one who

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Sangh strides to raise Fishermen's economy through co-operation

has visited the main storage centres like Sewri market. It is in fact necessary to explore the possibility of having "cool storages" at 60-70°F for products such as cured fish which greatly improves their shelf life.

Another field where greater attention is needed is the fish oil and fish meal industry. In spite of the existence of a large pelagic fishery like that of oil sardines, the above industry is still carried on premative lines and the oil produced is of a very poor quality; its only known use being as a boat paint on a local scale. Even the press cake is dried perfunctorily and the product known as "Guano" is of manurial grade. Export of "Guano" is at present quite insignificant by world standards. By improving the method of drying and controlling the bacteriological quality since countries like Germany insist on freedom from salmonella, exports can be stepped up. The same applies to sardine oil. Since large quantities of sardine oil are stored all along the west coast, addition of antioxidants of known efficacy offers an immediate possibility for improving its storage life. It is no doubt possible to improve the quality of the oil ultimately by dissemination of knowledge regarding better methods of processing but a more immediate solution is the pooling of the existing crude oil produced locally and refining by a method already worked out at the CFTRI. Hydrogenation into edible fat is also contemplated in recent years. There is also a plan to utilize sardine oil in canning. As regards fish meal, it might even be possible to increase its internal consumption as animal and poultry feed. There is an allround deficiency of cattle feeds and the animal feeding programmes have been assigned a high priority in the Five Year Plans. Development of cheap poultry feeds is likewise an urgent necessity. Although fish meal supplementation to animal feeds is practically unknown in India, there is no reason why it cannot be popularised. At present only the State Departments are producing high grade fish meal on a very limited scale.

Although freezing will continue to predominate as the method of choice for the export market in the case of prawns, freeze drying is also bound to develop sooner or later in India. In spite of the heavy investment needed this new technique offers great advantages. Semi-dried prawns have also become quite popular and enjoy a large market but basic research is still needed to stabilize the colour and prevent mould growth. Canning is very often summarily dismissed as a costly proposition under Indian conditions because of the high cost of the can itself and limited market but many people tend to ignore the immense advantages of canned products compared to other methods of processing from the point of view of the case of subsequent handling and prolonged shelf life. Canning might be advantageous at least in the case of a few popular or expensive varieties like pomfrets and seer fish. Another suggestion has been the possibility of processing in large cans cooked and minced whole fish, previously pressed to remove much of the water and oil if present. Studies on heat penetration in this type of cheaper packs would be helpful. At any rate, canning of tuna is being taken up to exploit the rich fishery of the Laccadive Islands. Before long the tuna stocks of the East Coast will also be available for commercial exploitation. Fish processing centres are coming up at Paradip and Kakinada on the East Coast which has been comparatively neglected till recently.

With a number of ice factories coming up all along the coast transport of fresh fish in ice has become quite common in recent years. Here again technological improvement are needed in the design of suitable containers. Work at the CFTRI as also the CIFT has revealed the usefulness of insulation of iced baskets by suitable linings. The CFTRI has also developed a highly useful technique to deodorize refrigerated railway vans used for transport of ice fish. This would make it possible to employ the same vans in the return journey for the transport of other foodstuffs

like butter, milk or fruits without contamination with fishery odour. Such multipurpose vans would be of great advantage in countries like India to promote refrigerated transport of perishable foods.

In addition to the existing avenues of utilization there is also scope for product development on new lines. It has been demonstrated for instance at the CFTRI that protein hydrolysates can be prepared from fish employing an indigenously available enzyme like papain. Products on similar lines not excluding fish paste or sauces, popular in other South East Asian countries can easily be prepared from local surpluses which are at present beach dried to yield only manure. Up to 10% of total catch amounting to several thousand tons is diverted at present to this wasteful method of disposal. Fish sausages are another novel innovation which can find a ready market. Another product on which worldwide interest is now evinced is fish flour which can serve as an odourless, fat free high protein concentrate. Sardines, Bombay duck and shark flesh are under study as possible raw materials under Indian conditions. Such a high protein preparation can serve as a good protein supplement by incorporation in bread, chappathies or biscuits. The CFTRI has developed a protein

concentrate based on fish, rice and coconut by name "Fricola" which was found to be readily acceptable to children.

From this above survey one can feel quite confident regarding the future of fish processing industry in India provided a concerted drive is initiated by all those interested in the industry to place it on a sound footing. There is need to diversify production to achieve maximum utilization of the raw material and the installation capacity. In this connection, the need for by-product utilisation in the fish industry has been pointed out repeatedly since several years but comparatively little has been achieved so far on a commercial scale barring laboratory trials. The main difficulty has been lack of appreciation of the basic problems involved which still await a solution viz. methods for preservation of waste materials, collection of sizable quantities at a few centres and pilot plant studies on the economics of any such projected industry. Recovery of protein, protein hydrolysates or even special amino acids like lysine which are in great demand, concentration of press liquor into condensed fish solubles, production of fish glue, manufacture of pharmaceutical chemicals and enzymes at least to serve as leather bases are some of the possibilities from wastes such as thrash fish, surplus catch now diverted into manure or fish heads, viscera and skin portions.

HEALTH CLAMP MAY UPSET PRAWN IMPORTS

Health standards, likely to be imposed by New South Wales this year, could reduce the inflow of imported prawns by up to 50 per cent.

This could cause a crisis in the catering trade and make prawns even scarcer and dearer to the public.

At present in N. S. W. there are no specific public health safeguards on prawns. They are covered generally by the Pure Foods Act and regulations.

Prawns for export, however, come under a very stringent set of health rules introduced, and policed by the Department of Primary Industry at Canberra.

A pointer to the pending change in N.S.W. health rules came from a meeting in Sydney, this month, specially convened by Dr. E. S. A. Meyers, the Director of State Health Services.

Australia's principal prawn importers were invited to the meeting.

WEST AUST. MOVE

The meeting was told that Western Australia had recently introduced new standards for prawns setting a limit to the bacteria as well as the streptococcus count. This had virtually placed a total ban on prawns from India.

Streptococcus causes stomach upsets and food poisoning.

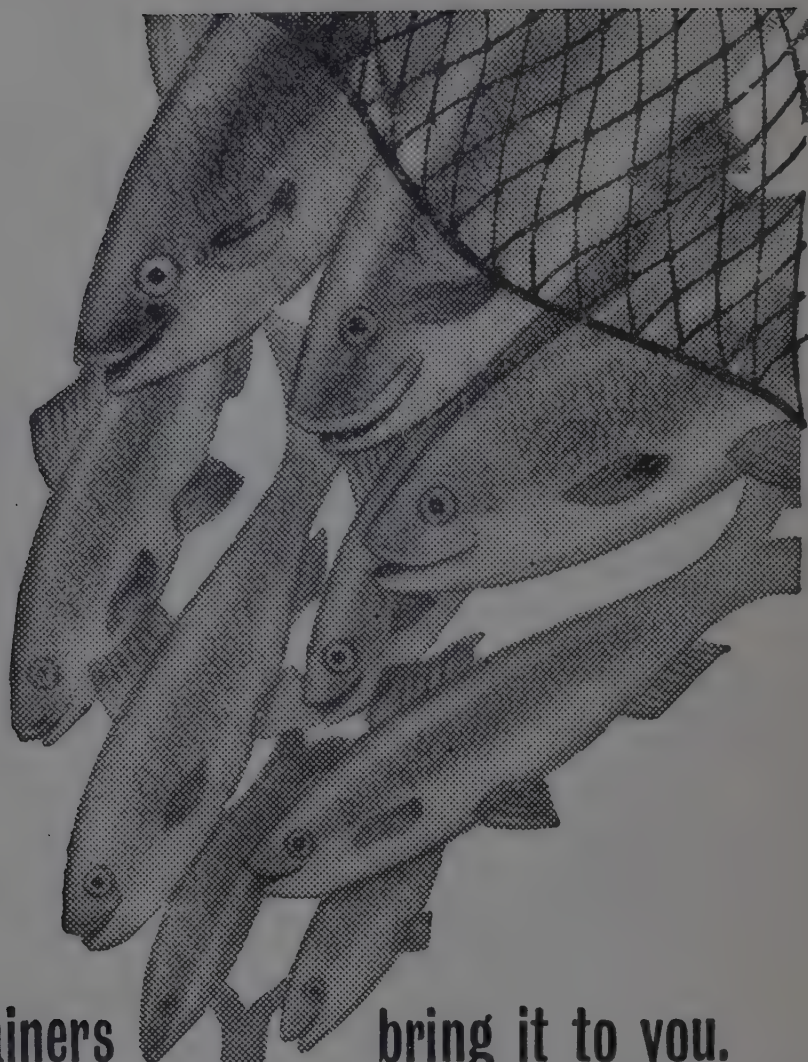
It was argued at the meeting, that were a similar law introduced in Eastern States, even Queensland and N. S. W. processed prawns would not pass the test.

The personal habits of the people who process prawns in Asian factories were discussed. Although this is an important factor in quality control, it was pointed out that germ-laden water was even a greater menace.

No matter how careful and clean factory workers are, the final rinse in contaminated water often undid all the good work. Also, ice made from impure water introduced germs to an otherwise pure product.

The meeting was told that two of the principal suppliers of prawns to Australia (Mitsubishi of Japan and The Dairy Farm Ice and Cold Storage Co. of Hong Kong) ensured a quality product by dual inspection. Biologists tested each consignment before it left Japan or Hong Kong. In Australia, independent biologists again tested prawns before releasing them for distribution.

bounty
from
the sea...



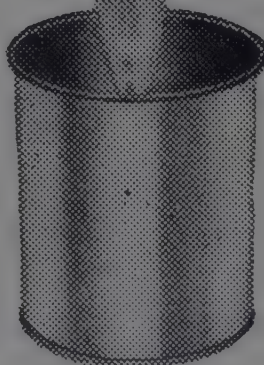
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Some importers felt the discussions were verging on a move to discriminate against prawns from India.

They were quick to point out the faults of products from other Asian nations and also, to emphasise, that processing plants they'd inspected in India were the equal of any in the world. Australian processing plants, in fact, showed up poorly besides Indian.

Some took the view that because it is the biggest producer of prawns in Australia, the health laws recently introduced by Western Australia were nothing more than a camouflaged "tariff barrier" against overseas competitors.

Outcome of the meeting is that importers will now follow a new set of rules aimed at keeping out "suspect" consignments of prawns.

Importers have agreed to carry out their own quality tests before accepting the imports.

The breathing space will enable Dr. Meyers to fill out his knowledge of the prawn trade and prepare regulations to close the loophole in the Health Act.

Mr. George Rochester, president of the Fish Importers' Association, and spokesman for the trade on such matters, was indignant about not receiving an invitation from Dr. Meyers to attend this month's meeting.

Mr. Rochester said the local processors and fishermen's representatives should also have been asked to attend.

"There are more 'risky' prawns produced locally than ever come from overseas," he declared.

—Fish Trades Review, Jan. 67

Referring to our article "Australia Introduces Bacteriological Standards for Indian Frozen Prawns" which appeared in our Jan./Feb. issue, Mr. N. J. Chacko of Messrs. Kerala Food Packers, Alleppey, writes to say :

- 1. The Australian restrictions are applicable to imports from all countries and not India alone.*
- 2. The goods that do not pass the Australian Health Authorities' tests will not be allowed entry into Australia but can be shipped out of the country.*

With regard to point No. 1, while what we endeavoured to show was how the Australian order affected the Indian Seafoods industry particularly, It was far from our intention to give the impression that the Australian Authorities' ban affected only shipments from India.

Regarding point No. 2, what we published was based on the information contained in a circular issued by the Marine Products Export Promotion Council on the subject.

EDITOR.

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PYRAMID OF LIFE TOPSY-TURVY

MIKHAIL KAREV

“**F**OOD RELATIONS” in nature resemble a pyramid. On land plants and plant eaters are at the bottom and carnivores such as tigers and lions, which do not provide other forms of life with food, are at the apex.

Of late scientists in many countries have been intensively studying ocean life. They have encountered unexpected phenomena not in the mysterious depths of the oceans populated by known species but in the top layer of water no little more than 100 metres down.

It was found that the total biological mass of the sea population was nearly 20 times that of the algae in the well-lit surface layer of water. Deep down there is hardly any plant life at all. In fact fish, whales and calmars, which correspond in water to large land carnivores have practically the same mass as all algae. What on land is the apex of the pyramid of life is in the water its basis—which at first glance seems absolutely incredible.

The answer to the riddle is provided by unicellular algae which provide for the basic food the small shellfish that in turn are eaten by fish and other denizens of the sea. According to our “land” conceptions, the single-celled weeds

triggering of the food chain in the seas and oceans should form the basis of the pyramid of life. But they have a mass which is but a twentieth, if not less, of the aggregate mass of all the other sea denizens.

How can one explain this odd ratio between eaters and eaten in the sea? It appears that unicellular algae multiply with surprising rapidity. Though they aggregate a total weight of “only” 1,500 million metric tons, the annual increment is 550,000 million tons, 366 times more than their own weight! This means that algae reproduce themselves completely every day.

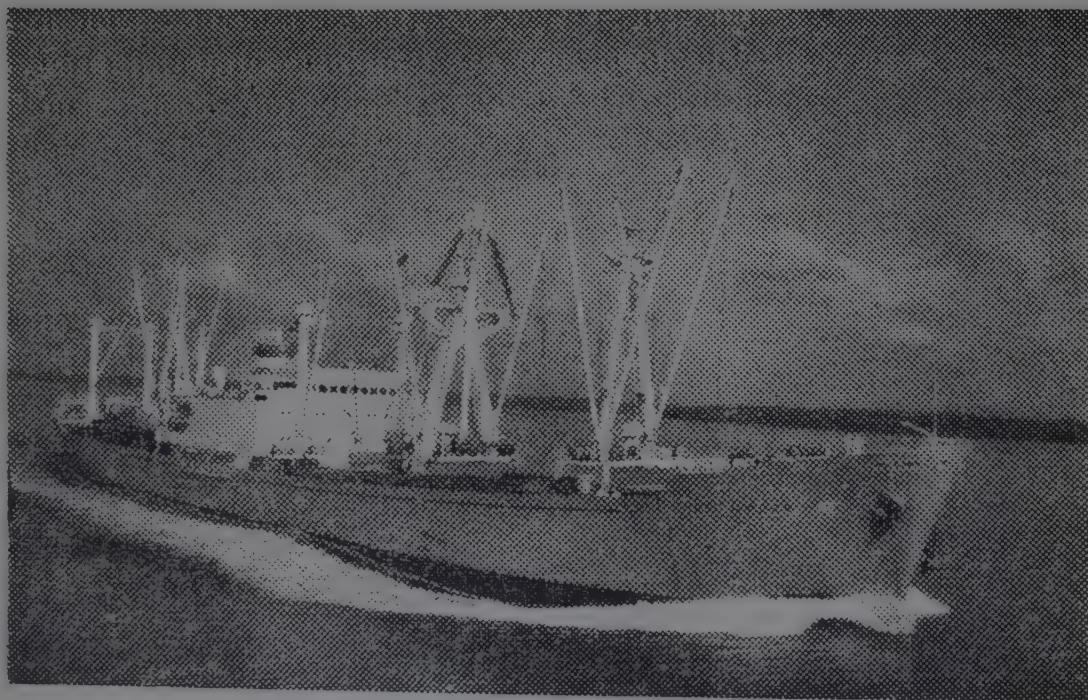
Small shellfish conduct a curious way of life. In the daytime they descend to a depth of 100 metres, where they evidently sleep and in night “browse” on these “grazing grounds”. Even if these hungry creatures were to manage to gobble up half the algae in the space of the night—which, of course, they aren’t able to do—even in that case the algae would repair all the damage done. It is thanks to the algae’s surprising ability to grow and multiply, that a relatively small amount of sea plants feed a

tremendously vast number of plant-and fish-eaters.

Algae are not evenly distributed. Both in the depths and at the surface we find many "deserts", much bigger than the Sahara in area. There is little in the way of weeds in the surface layer of the Pacific and Atlantic, both north and south of equatorial currents and in many places of the Indian Ocean. Only 17 per cent of sea and ocean surface is densely covered with weeds. It is these densely-weeded waters,

which to our eye seen absolutely limpid, that feed all denizens of the sea, horizontal currents carrying over vast distances the nutritive substances that algae synthesise.

Sea food is playing an increasing role in the task of feeding humanity. It is impossible to assess resources of fish, whales and other sea products or to establish the laws governing their proliferation without studying the food chain in the sea. No wonder, the biological investigation of algae is of both great scientific and practical importance.



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Utilization of sardine oil-

Preparation of ready-mixed paints

Having worked out the method of extraction of good quality sardine oil, this Institute has been investigating on the more economic utilization of the oil. The method for preparation of factice or mineral rubber from sardine oil has been reported earlier. (Fish Technology Newsletter, Volume VI, No. 4, January 1966). Attempt was also made at this Institute to find out the possibility of using the oil as a vehicle for preparation of paints in place of the generally used oils like linseed oil. Linseed oil is comparatively costly, a good part of the requirement is imported and moreover, in some places the oil is in demand as an edible oil. A cheap substitute for the oil would be most welcome to the paint industry. If sardine oil can be utilized as a substitute that would be quite beneficial to the oil extraction industry also since in that case a reasonable price can be obtained for the oil.

Investigations carried out so far have shown that the stearine separated fraction of the oil after polymerisation under controlled conditions could be made use of for the preparation of ready-mixed paints. The method tried at this Institute in this respect is summarised below:-

Method

1. *Quality of the oil:* The sardine oil used should be of good quality. Prepare the oil by the improved method. (Ref: Fish

Technology Newsletter Volume VII No. 2, July 1966).

2. Remove the stearine fraction of the oil by chilling the oil at 8–10°C and then by centrifuging. Collect the stearine separated fraction.
3. Heat the destearinated oil at 200°C for 2 hours after adding 1% by weight of cobalt oxide.
4. Treat the destearinated and heat-bodied oil with 40% by weight of rosin for 8 hours at 250°C.
5. Mix the resinous product with thinner, dryer and pigment in correct proportion. In the method tried at the Institute, zinc oxide at the level of 60% by weight was used as the pigment and 1% by weight of cobalt naphthanate was added as the dryer along with the thinner so as to obtain a consistency of 200–300 seconds through a Ford Cup. No. 4 (Ref: I. S. 101–1964).

The product was found to be suitable for application as a ready-mixed paint. The results of the tests for quality of the product is mentioned below. It also needs mention that the product on analysis was found to conform

to the standards for ready mixed paints, specified by Indian Standards Institution.

1. Drying time:

i) Time for surface drying — 4-8 hours

ii) Time for tack-free drying—36-48 hrs

2. Consistency through Ford cup No. 4 } 250 ± 20 seconds

3. Spreading rate 11-12 sq. in/L/e

4. Scratch hardness 1300 gm.

5. Pressure test 2.3 kgs.

6. Flexibility and adhesion } 1300 gm.

7. Stripping test 1300 gm.

8. Resistance to lubricating oil Satisfactory

9. Resistance to SBPspirit „

10. Resistance to petrol „

11. Resistance to water „

— *Fish Technology Newsletter*, Jan. '67



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Reglazing of Frozen Prawns-

Quality of Water to be Used

REGLAZING is carried out for giving an additional coating on the frozen prawn block so as to prevent dehydration during frozen storage. Commercially reglazing is done in two ways as follows :-

1. By dipping the frozen block in ice cold water for a few seconds.
2. By adding ice cold water on the frozen block kept in the carton.

In both cases, a thin coating of ice is formed over the surface of the block. The method of reglazing as well as the quality of the

reglazing water used have been subjects of study at this Institute. It has been observed that more bacteriological contamination takes place when the reglazing is done as in the method first mentioned. This is mainly because several blocks are dipped continuously in the same water. Even 60-70 blocks are observed to have been dipped in the same water in some freezing factories. As more blocks are dipped in the same water, the water becomes more and more polluted and the bacterial load in the water becomes so high that it starts contaminating the subsequent blocks. The extent of increase of the bacterial load of reglazing water caused by successive dipping of the frozen blocks can be seen from the table given below :

TABLE - I

INCREASE IN THE BACTERIAL LOAD OF THE REGLAZING WATER BY INCREASE IN THE NUMBER OF DIPS

No. of blocks dipped	EXPERIMENT I			EXPERIMENT II		
	Total count per ml.	Faecal strep- tococci per ml.	E. coli per ml.	Total count per ml.	Faecal strep- tococci per ml.	E. coli per ml.
0	15	Nil	Nil	10	Nil	Nil
8	280	1	Nil	210	2	Nil
16	420	3	Nil	314	2	Nil
24	970	12	1	1010	6	Nil
40	8760	16	12	3000	40	20
50	12,000	40	20	4300	60	30
70	40,000	90	30	5600	80	44

Water chlorinated at ordinary level (5 ppm. level) for use in processing factory was found to be effective in checking only the faecal organisms; the total bacterial load remained almost unchanged. But the reglazing water chlorinated at 50 ppm. level was found to be effective in preventing the blocks from contamination

even after successive dips in the same water. has been observed that water chlorinated such level can be used for dipping about 60 blocks without changing it. The total bacterial load of the water, chlorinated at 50 ppm. level is found to be below 1000/ml, after dipping about 60 blocks. (Table II)

TABLE II

BACTERIAL BUILD UP IN REGLAZING WATER CONTAINING
50 ppm. CHLORINE

No. of dips	TOTAL COUNT/ML.			E. coli & Enterococci
	Series 1	Series 2	Series 3	
0	6	16	6	
4	6	16	12	
8	10	20	20	
12	18	120	40	
16	120	260	120	
20	210	200	160	Nil in all the cases of all the series
24	300	115	140	
28	320	120	200	
32	360	80	110	
36	420	80	290	
40	400	120	330	
44	420	110	340	
48	610	510	630	
60	910	810	760	

The chlorine level of 50 ppm. in the reglazing water has not been found to affect the quality of the frozen material in any way since the time of contact of the material with the

water is only for a few seconds. Thus it is clear that water chlorinated at 50 ppm. level can be used for reglazing purpose.

—Fish Technology Newsletter, Jan. 67

NEWS & NOTES

ISEA President Elected M. L. A.

In the recent General Elections Shri Baby John, Proprietor, Kerala Seafoods, Neendakara and President, Indian Seafood Exporters Association, Cochin, has been elected as a member of the Kerala Legislative Assembly.

New Members of the ISEA

The following new members were admitted into the Indian Seafood Exporters Association :

1. M/s. G. Hira & Co.,
99, Marine Drive,
Bombay-2
2. M/s. Konkan Canned Food
Products (P) Ltd.,
Zadgaon,
Ratnagiri.
3. M/s. Madonna Canning Co.,
Srinivasanagar,
Mangalore.
4. M/s. Victoria Forwarding Agency,
5, South Emperor Street,
Tuticorin-1.

Beypore Fishing Harbour

The first stage of the construction of the Beypore fishing harbour, offering berth facilities to 40 feet fishing trawlers has been completed. The first stage of the comprehensive scheme for the development of this harbour costing Rs. 9.51 lakhs provides a landing quay, fish receiving and auction hall, fish packing hall, water supply and electrification.

The complete scheme is estimated to cost Rs. 40 lakhs.

Indo-Norwegian Projects

The agreement between the Government of India and Norway on the Indo-Norwegian Projects in this country is likely to be extended for a further period of five years, according to reports. Discussions, it is stated, were on between the two Governments for the renewal of the Project Agreement expiring on March 31. In this connection the Norwegian Government has already allotted a sum of approximately Rs. 420 lakhs for the Project Schemes during the next five years.

Four fisheries development schemes undertaken by the Project at Ernakulam, Cannanore, Mandapam and Karwar are in various stages of progress.

INDIA'S MARINE EXPORTS ARE BIG FOREIGN EXCHANGE EARNERS.

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to help make them
bigger still.



Marine exports from India have grown steadily over the years. They could grow a lot more, considering the world demand for canned fish and shrimps. And grow they must, now more than ever. But to do that, they must be supported with modern canning methods and facilities...facilities that will make the growth in marine exports possible.

Take Kerala.

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Utilising the silver jelly available at Mandapam, a fish meal plant is proposed to be set up there. The plant for which equipment has already been ordered from Norway would have a capacity of 50 tonnes of fish. Work on the erection of ice and freezing plants at Mandapam is proposed to be speeded up so as to complete it in five months. Meanwhile construction of a similar plant and a boat-building yard at Cannanore has already been completed. These would be commissioned as soon as power connection is made available.

* Seaweed Project for Australia

Bullet Enterprises, a West Australian firm, has applied for the lease of a square mile of Peel Island, on the edge of Mandurah estuary, to establish a seaweed farm. The firm proposes to grow the weed on sunken wooden platforms and netting suspended about 6" above the estuary bed. The weed will be processed to derive extracts for export.

West Australian Fisheries Department has power to control the commercial exploitation of seaweed.

* Fish Trades Review

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Item-wise Exports of Marine Products from India During 1966

Items	Quantity (Kgs.)	Value (Rs.)
Frozen Froglegs	5,56,833	55,76,003
Lobster Tails	80,802	14,74,477
Frozen Prawns	87,83,545	8,87,91,851
Frozen Fish	2,026	25,204
Canned Prawns	15,23,327	1,86,56,606
Canned Fish	155	833
Dry Fish	65,52,756	1,32,45,714
Dried Prawns	11,63,142	52,70,682
Shark Fins & Fish Maws	1,39,440	13,39,721
Fish Oil	49,560	60,348
Prawns Powder	81,487	53,471
Sea Weeds	1,62,608	4,17,677
Crab Meat	1,325	7,682
Fish Bones	17,345	50,384
Fish Pickles & Prawns Pickles	6,742	87,125
Turtle Meat	2,518	60,423
Sea Shells	4,570	80,144
Beach-de-mer	21,886	39,631
Other items	3,293	8,246
Total	1,91,53,360	13,52,46,222

Country-wise Exports of Marine Products from India

During 1966

Countries	Quantity (Kgs.)	Value (Rs.)
U. S. A.	81,20,502	8,10,20,174
France	6,21,279	75,44,399
U. K.	5,41,720	59,90,641
Switzerland	18,946	2,08,743
West Germany	32,747	4,11,616
Australia	5,76,549	61,11,918
Japan	11,86,966	1,25,16,935
Belgium	43,013	5,34,254
Netherlands	67,493	6,53,831
Spain	3,246	22,207
Denmark	8,201	1,17,690
Italy	20,574	3,09,731
Kuwait	3,954	22,751
Mozambique	1,423	17,905
Sweden	39,501	5,74,544
Puerto Rico	4,200	54,735
Greece	2,042	35,799
New Zeland	10,229	1,30,121
Cyprus	2,257	49,064
Aden	664	10,553
Finland	340	3,835
Hawai Island	15,027	1,40,844
Jamaica	19,878	1,28,191
Trinidad	2,602	23,718
Saudi-Arabia	3,362	17,380
E. Germany	4,841	91,072
Mauritius	82,803	3,50,965

Items	Quantity (Kgs.)	Value (Rs.)
Ceylon	66,71,224	1,34,93,954
Malaya	68,677	1,46,168
Singapore	2,06,806	9,70,247
Fiji Island	2,271	10,906
Kenya	1,182	8,094
Hong Kong	6,98,051	32,82,341
W. Indies	2,055	21,355
Iraq	46,360	55,966
Iran	3,200	4,382
New Calidonia	4,251	35,296
Canada	4,818	37,934
Reunion	2,032	19,217
Syria	2,400	16,350
Thailand	1,000	8,900
E. Africa	1,210	4,828
Burma	500	12,000
Other Countries	2,964	24,768
Total	1,91,53,360	13,52,46,222

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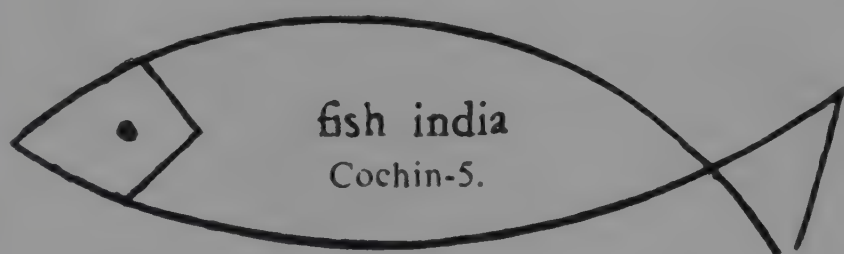
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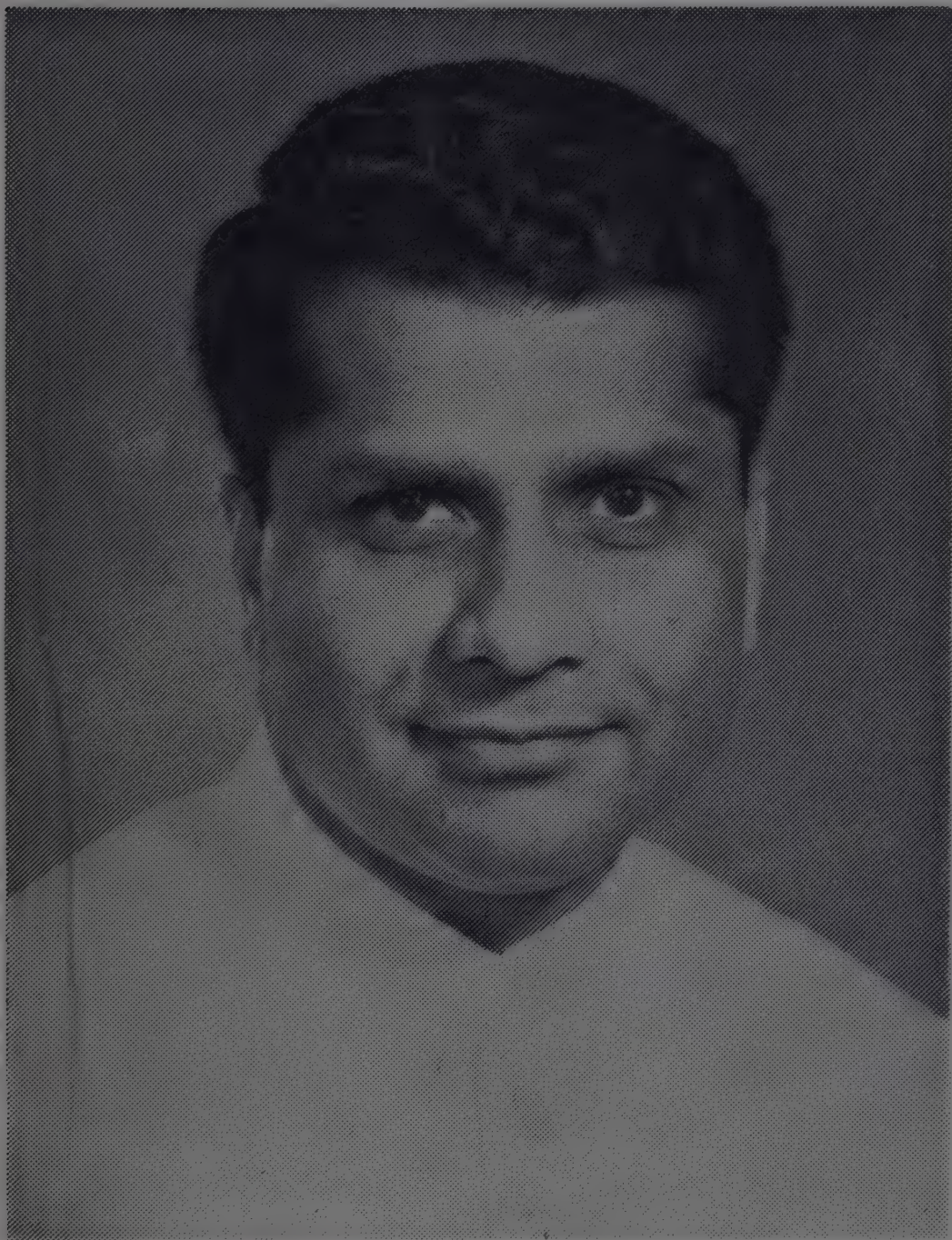
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Minister for Commerce, Govt. of India



SEAFOOD EXPORTER

VOL. 1

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MARCH '67

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No. 11

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OUR COVER

*A view of the Indian
Stall displaying Seafoods
at the New York World
Trade Fair.*

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Editorial

SHIPPING, the importance of which could never be underestimated, has become a problem for the Indian Exporter. While, on the one hand, the call for increasing the country's exports is frequently heard, the Government cannot take credit for doing anything tangible or effective to help shippers with the required shipping facilities.

Adequate and timely shipping facilities are a condition precedent to increasing exports. We are afraid, enough attention has not been bestowed on this important aspect and, therefore, it will not be surprising if the export targets set before the country remain unfulfilled.

All along, the country has been dependent on foreign shipping lines for lifting her cargo. Frequent increases in freight rates, uncertainty of sailing schedules, last minute cancellation of ports of call and space reservations besides shutting out of cargo have become common occurrences which adversely affect exporters and cause considerable hardship to them. Instances are also not few where bookings made in advance were cancelled by ship-owners or their agents on the plea that the previous port of call offered better inducements. An important factor to reckon with is that, as compared to other commodities or goods, most of the seafood items call for refrigerated space. Shipping facilities in this respect have woefully failed to keep pace with the growing volume of seafood exports.

Seafoods being a highly perishable cargo, delays in shipment result in heavy losses to exporters. Moreover, owing to the dearth of cold storage facilities, it is impossible to think in terms of keeping stocks indefinitely. If stocks intended for shipment are held up, production of further quantities are curtailed, depending upon the limited storage facilities available. The frequent shutting out of cargo taken for shipment add to the worries and problems of the exporters. The port warehouses do not have cold storage facilities for such goods.

Therefore, bringing the cargo back and finding suitable storage space for it awaiting the next shipping opportunity present problems of a serious nature. This avoidable re-handling makes the frozen cargo susceptible to damages. In the case of other items like dried prawns even a reprocessing would be called for. Then there is the problem created by expiring letters of credit opened by consignees.

All things considered, therefore, the need for urgently investigating into the possibility of providing adequate reefer space has become imperative. While planning for achieving self-sufficiency as a long-term measure can go on, immediate relief should be given to shippers. This could be done by assessing the requirements of each port by way of reefer space and general cargo and allocating adequate quota commodity-wise and on the basis of specific dates of sailings. We suggest that a committee consisting among others of the representatives of exporters should be constituted for this purpose. It should meet once a month and after assessing the requirements of the trade fix the quota. Extra sailing opportunities should also be arranged whenever they become necessary. In this connection the longstanding complaint of inadequacy of sailings to Continental Ports which offer immense scope for exploitation should also be examined. Hitherto Continental markets have remained without being tapped fully in respect of Seafoods. It would not be undesirable to fix freight rates valid for a five-year period in consultation with the shipping interests concerned to avoid frequent revisions.

During the past few years the Seafood exports have recorded a substantial increase and it is expected that the tempo would be maintained so as to achieve or exceed the target fixed by the Planning Commission. But, it must be borne in mind that lack of shipping and other essential facilities would undoubtedly retard progress and result in loss of valuable foreign exchange.

It is our earnest wish, therefore, that the authorities concerned would lose no time in addressing themselves to the task of solving these problems and facilitating prompt shipment. That way lies the successful implementation of an uninterrupted production programme designed to help the developing economy of the country.

SEA FOAM:

Cradle of Life on Earth

— ROBERT KOROTKY

THE myth about the beautiful Goddess born of sea foam is not so fantastic as it might seem. There exists a hypothesis that sea foam was the cradle of life on the Earth. Advanced by John Bernal, the British scientist, the hypothesis proceeds from the fact that organic materials dissolved in water are concentrated in the foam.

This foam forms over three quarters of our planet's surface to this day. If we assume that it was capable of producing life in the vast Primary Ocean, then we may ask: what does it produce today—only poetic associations or material things too?

For Yuvenali Zaitsev, Doctor of Biology, the road to the "hyponeuston" theory began from the solution of a practical problem. He had to find where the mullet—a valuable commercial fish—propagates, the young of which are being bred in sea-coast water bodies since ancient times. For this purpose Zaitsev evolved a hydrostatic method of searching for roe and unexpectedly arrived at the conclusion that mullet roe was to be looked for in the boundary layer between the sea and the atmosphere.

Most scientists considered the top centimetres of the sea to have nothing of particular

interest, because the strong sunlight frightens away, and sometimes even kills the inhabitants of the sea. Special nets had to be invented to handle the upper layers of sea water. This proved to have unexpectedly high concentrations of bacteria, protozoa and larvae of all sorts of marine inhabitants. Zaitsev proposed to call this concentration of living organisms the "hyponeuston."

INTENSIVE AND VARIEGATED LIFE ON WATER SURFACE

Performed in other seas and oceans, these investigations showed always the same picture—intensive and variegated life on the water surface. This gave grounds for the first conclusion that the hyponeuston was an extensive community of organisms in the World Ocean. It plays the important part of serving as a kind of incubator or nursery for the young of hundreds and thousands of invertebrate and fish species. It is here that the reserves of the organisms, which the steadily growing human race is in need of, are reproduced.

What causes this abundance of life in the subsurface layer of the sea? Zaitsev considers sea foam—the clot of dissolved organic sub-

stances so essential for the development of life—to be among the most important prerequisites for the appearance of the hyponeuston in the World Ocean.

Foam is constantly formed on the surface of seas and oceans from the immense quantities of organic matter discharged into the water by living and dead inhabitants of the sea. The concentration of these “fertilizers” gives rise to a turbulent flare-up of life. The bacteria are the first to “respond.” They develop here as quickly as on an artificial nutrient medium. Bacteria serve as a basis for the formation of numerous protozoa, then small multicellulars, and so—link after—the entire “chain” of hyponeuston elements is built up: from bacteria to small fry. In the surface layer on the sea the young fish are most adequately provided with the necessary food. Moreover, it is only in the upper few centimetres that young organisms get the infrared and ultraviolet rays of the solar spectrum.

As they grow the young fishes and bottom-living animals leave the surface layer, and in the process of life and after death they return the organic substances which they had extracted from the foam.....So, the hyponeuston has inherited the cradle in which life originated once upon a time.

STUDY OF SEA-ATMOSPHERE

BOUNDARY AREA

Last year, the Presidium of the Ukrainian Academy of Sciences decided to organise a special department for studying the sea-atmosphere boundary area. The department

was set up at the Odessa branch of the Institute of the Biology of South Seas. This hyponeuston department is the first and still the only in the world body of scientists engaged in large-scale research into the uppermost layer of the World Ocean.

Some aspects of the hyponeuston theory have found practical application already. Prospects for intensifying mullet breeding in the southern seas of the USSR have been mapped, a special young-fish hyponeuston trawl has been devised and successfully used for exploring commercial fish stocks. The hyponeuston is of major theoretical and practical importance from the view-point of marine radio-oceology—the science which deals with the attitude of marine organisms to the radioactive factor. Gennadi Polikarpov, Doctor of Biology, considers the hyponeuston to be among the Earth's communities which are most sensitive to radioactive radiation.

When nature was choosing the site for one of its most important nurseries, food and sunlight were the most important conditions. It chose the upper layer of the sea which meets these requirements. In the second half of the 20th century formerly unknown radioactive fallout of intensive biological effect started falling upon this nursery. The embryos and larvae concentrated in the hyponeuston are far from being indifferent to this fallout. What will the latter's effect lead to? That is one of the many questions to be answered by the investigators of the hyponeuston—the layer where the future of the ocean is born.



OPERATION AND MAINTENANCE OF FISH FINDER

The Different Parts of the Instrument

IN the early twenties of this century the echo-sounder came into use in many countries for the measurement of depth of water. Later on, the instrument was suitably modified as a fish-finding device.

In the present day the fish-finder is an essential equipment of a modern fishing vessel. Apart from its general use for measurement of depth of fishing ground, it helps to locate the fish shoals and to study the behaviour of fish schools. The fish-finder with some modifications is also used to measure the various parameters of the fishing gear under operation.

The different parts of the fish-finder and their working are briefly described below.

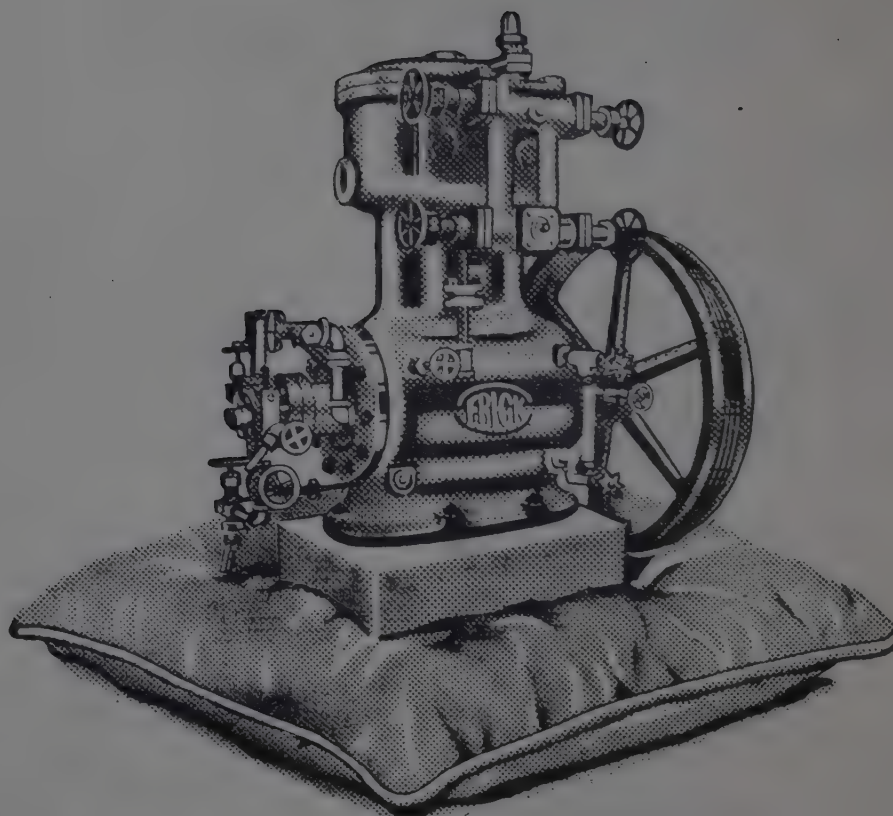
The principle of working of the fish-finder is based on the measurement of the time interval between two positions of a sound pulse. The velocity of sound in a medium is constant and hence the time interval between two positions of a sound pulse is a measure of the distance it has covered during that time. The fish finder sends a narrow pulse of sound energy and receives it after getting it reflected from the object. A rotating needle - the measuring device - of con-

stant speed will indicate or record the positions corresponding to the transmission and reception of the pulse. As the sound gets reflected from all material objects during its path, the positions of these objects also will be shown.

The fish-finder consists of the following important parts:

1. An oscillator for the production of electrical pulses.
2. The transducer which converts the electrical signals into sound waves.
3. Receiver and amplifier for receiving the sound waves and converting them into corresponding electrical signals and subsequently for amplifying them.
4. The indicator or recorder which will show the positions of the objects in the path of the sound wave.

The Electrical Oscillator: This is the first stage of the operation of the fish finder in which the frequency of the transmitting sound is decided. The output of the oscillator normally varies from 100 V to 1000 V depending upon the type and range of the instrument. The



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most conventional type of oscillator uses flash tubes for producing short pulses. The duration of this pulse is an important factor which decides the resolution of the objects in the direction of propagation of the sound waves in water. For better resolution (i. e. discrimination), the pulse should be very short. The oscillator is triggered at definite intervals either mechanically or magnetically and the time interval between two pulses will decide the range of the finder.

The Transducer: The Transducer is the device for converting electrical signals into corresponding sound waves and vice versa. Two different types of transducers working on the electrostrictive and magnetostrictive principles are in use.

In the electrostrictive method the oscillator output is fed to a crystal which undergoes mechanical oscillation according to the electrical signal. The frequency of crystal transducers usually varies from 40 Kc/s. to 400 Kc/s. As the sound waves have to get reflected from small objects like fishes etc., their wave length must be smaller in comparison with the objects, hence

for better resolution and sensitiveness they require higher frequencies. So crystal transducers are normally used in fish finders. The power handling capacity of crystal transducers is comparatively low and therefore their range is normally limited below about 500 metres. A higher frequency is also required for a low beam angle since a low beam angle will indicate the position of objects more accurately.

Magnetostriction is a phenomenon observed in some metals like nickel, iron and cobalt. Here the materials will undergo mechanical oscillations when they are subjected to varying magnetic field. This magnetic field is produced by the electrical energy from the oscillator. Of the above metals, nickel is the most sensitive one for this purpose and is commonly used. Nickel transducers are used in fish finders where higher power output is required and where high frequency is not very important. The frequency of nickel transducers normally varies from 10 Kc/s to 40 Kc/s. and nickel transducers with the range upto 4 or 5 kilometers are available.

In both cases, the transducer elements are kept in watertight chambers.

—Fish Technology News Letter





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U. S. Imports of Frozen Shrimp

Robert S. Russel,
*President of Seastar Inc.,
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ABOUT twenty years ago, here in the United States, the per capita consumption of shrimp was about one-half pound. The latest statistical reports published by our Government indicate that per capita consumption for 1966 rose to about 1.40 and probably when the final figures are in we will see a figure close to 1.5 lbs. Considering the general apathy of the American people for fish products, this is a remarkable increase which must be tied in with general population growth.

There was also, in 1966 a substantial increase in imported frozen shrimp, with the final quantity now stated to be 193.2 million pounds. In 1965 the figure was 178.9 million pounds. In 1950 only about 40 million pounds. The trend has been upward for imports whereas the domestic fishing industry cannot hope to keep up with the increased demand. As a matter of fact, our domestic industry produced in 1966, 126 million pounds and in 1965, 139.6 million pounds, which represents a sizable decline in landings. It is interesting to note that construction of new shrimp trawlers here in the U. S. A. actually increased during 1966 with the

emphasis on the larger 72 to 75 ft. wooden trawlers. A few 80 to 85 ft. steel trawlers were built, indicating the necessity to fish farther and farther offshore.

On the other hand, in 1966 the total consumption of shrimp was 272 million pounds whereas in 1965 it was 281.6 million pounds. Thus, although imports increased in 1966, the overall consumption decreased. Probably the major factor for this decrease in consumption was price. Shrimp prices have advanced rapidly and right now the average consumer simply cannot afford the item as a staple food product. There is very little doubt that consumption would increase markedly if prices were about 10% lower. This should be balanced off with the supply-demand picture in general and the slowly mounting cost of all varieties of foods.

Another factor of significant importance to our shrimp industry is the ability of the foreign countries to produce good quality peeled deveined shrimp for our market. Here in the U. S., the processing costs are extremely high

whereas shrimp processed overseas results in a saving in labour to the consumer here. In this area of reduced costs, it would be wise indeed for the overseas suppliers to concentrate their production because this must inevitably be the form most popular in the U. S. market. The freezing and processing of single frozen shrimp will also be of great importance to foreign suppliers because this method of portion control and convenience is rapidly gaining ascendancy over other types of packings.

It is our opinion that during the first half of

1967 prices will remain firm and strong except for special sizes which are imported occasionally in great abundance. For example, the small titi shrimp (about 130 count up) peeled and deveined is being heavily produced in South America and some of the Asian countries. The demand for this size is excellent but with large quantities arriving in the next few months, the price could decline. In general, for the coming year, the market situation looks very bright indeed, with increases in consumption and demand, and increases in imports from many parts of the world.

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In the Depths of the Indian Ocean

A Talk With Soviet Oceanologists

K. P. Prakasham

IT was an illuminating experience for me to meet the two Soviet scientists from the Institute of Oceanology of the USSR Academy of Sciences, who came recently to this country for attending a world Conference on the Indian Ocean. They were Prof. Theodor S. Rass and Dr. V. G. Neiman, veteran oceanologists who have already spent years in the pursuit of their vocation. They have participated in several expeditions to the Pacific and the Atlantic oceans, and are pioneers in a comprehensive study of the practically unexplored Indian Ocean. Their research vessel, the *Vityaz*, began its exploratory cruise of the Indian Ocean as early as 1959, much before any nation had dreamed of such an adventure, much before the United Nations had sponsored the multi-nation exploration programme.

It was first in 1959-60 that the *Vityaz*, starting from the Pacific and passing through the Mediterranean and the Black Sea, explored the Indian Ocean. During its second cruise she followed another route, studying the areas which were not covered by the first one. The ship's third cruise was undertaken in the summer of 1962, under the programme of International Indian Ocean Expedition. During these expedi-

tions simultaneous studies were made on all aspects of oceanology, physical and chemical properties of the waters, currents, temperature and salinity, radioactivity and biological aspects including the study of primary production. The 4th cruise in 1965 was mainly geophysical, studying bottom sediments, canyons, relief and the mineral structure of the bed (itself below the sediments). The expeditions were usually of the duration of five to six months each.

FISHES AND THEIR WAYS

Prof. Rass explained to me the new methods experimented by him had his colleagues in luring fish. Certain species of fish, he said, readily responded to electric stimuli, and also to certain chemicals. It was interesting to hear him explain the method of luring fish by means of electric lights. He said that, drawn by powerful light, many fishes came right to their ship, attracting in their wake predatory giants like sharks. It was an exciting sight, he said, to see the flying fish skipping over the waters and glittering in the sunlight falling right into the ship.

In his conversation Prof. Rass touched upon the interesting subject of food resources of the Indian Ocean and the possibilities of increasing the catch.

India has a 3,000-mile coast-line and a population that ranks among the biggest fish-eaters of the world. But the yearly catch of fish made by Indian fishermen operating in the sea is one of the lowest in the world. According to Prof. Rass, out of the world catch of 52.4 million tons of fish the Pacific accounts for 24 millions, the Atlantic about 20 millions, while the Indian ocean only about 2.5 millions. Though the area of the Indian Ocean is, Prof. Rass pointed out, 2.5 times less than the Atlantic, the catch is ten times less. The reason for this deficiency lies, according to Prof. Rass, in the almost primitive, uneconomic and outmoded fishing methods in vogue in the country; fishing is mostly confined to near-shore waters, especially pelagic fish.

The search for fish, Prof. Rass stressed, should be intensified on a scientific basis. For instance, the Indian fishing industry should take into account all indicators for the possibility of fish resources, such as availability of

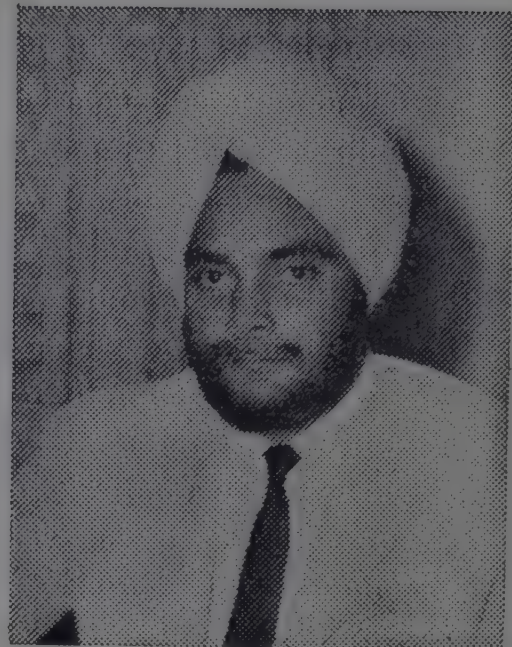
planktonic matter, low salinity, meeting zone of upwelling cold waters rich in nutrients.

"And it is in this field that my friend's service becomes absolutely essential," Prof. Rass said, pointing to Dr. Neiman, physical oceanographer. "Prof. Rass can tell you where to catch what, and I can tell you why it is there, what physical conditions brought it there" Dr. Neiman said in his natural, lucid manner. "And once you know the physical conditions", he continued, "you need search for fish only in those areas where such conditions exist." He then dwelt on some of the studies conducted by the *Vityaz* in his own special field, the study of current patterns in the Indian Ocean, which is, he said, "dissimilar to that of the Pacific and the Atlantic." It was during the third *Vityaz* expedition to the Indian Ocean that we discovered that wind direction in the stratosphere over the Indian Ocean changes diametrically opposite once in two years," he said. He also referred to the fact that the expedition has made outstanding contributions to the study of movement of water masses, upwellings of nutrient-rich oceanic currents, besides preparing detailed charts and maps.



DEVELOPMENT PROBLEMS IN REFRIGERATION INDUSTRY

Manmohan Singh
Managing Director
Frick India Limited



BROADLY speaking, the development problems in the Refrigeration Industry can be classified into various categories such as psychological, Government, technical and commercial.

PSYCHOLOGICAL PROBLEMS

In 1958, the Government suddenly became aware of a very acute shortage of foreign exchange on the import of all air conditioning and refrigeration machinery. Until then the trade was enjoying a liberal import policy. This liberal import era, however, had created certain psychological barriers in the mind of the consumer against the use of indigenous equipment. There was a sudden vacuum in the market created by this sudden ban on the import. As a consequence of this situation the industry took its birth in a haphazard fashion, the growth was not scientific, the manufacturers

were not quality minded as anything could sell out of sheer acute demand, raw materials were non-standard and know-how was hardly anything beyond a good effort to copy imported products. All this further lowered the reputation and prospects of indigenous industry. Both the consumer and the trader started a virulent campaign against the case of indigenous industry and thus were successful in retarding its growth for a considerable period. Even after ten years of development of this industry, the housewife still looks for an imported refrigerator or air conditioner and the same way the industrial consumer does try hard to find a loophole in Government restrictions to import his products.

GOVERNMENTAL PROBLEMS

After imposing a practically complete ban on the import of refrigeration and air-conditioning industry, instead of encouraging the

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indigenous growth of the industry, the Government further penalized the industry by classifying it as a low priority industry conforming to the luxury class. The high taxation applicable to such category of industry gave it a further blow. The worst had still to come in 1962 when the finance bill of the Government included an excise duty of 30% on major components of this industry and in 1963 it was further raised to 40%. This lack of understanding of the role of this industry on the part of the Government gave a death blow to an industry which had still a long way to go in solving its teething troubles.

The Air conditioning and Refrigeration Council of India met in several emergency meetings to remedy matters by starting a vigorous campaign in educating the consumer, the politician and the Government about the real role that the refrigeration and air conditioning industry played in the developed economy as envisaged in the Five-year plans. Propaganda posters, publicity brochures, advertisements and cartoons depicting such vital roles which the industry plays in the development of fisheries, dairies, pharmaceuticals, fertilizers, chemicals, artificial fabrics and food preservation were publicised. This had miraculous effect on the general understanding of the national planners and the Government by a notification in 1964 declared this industry as one of the 59 priority industries thus facilitating the flow of raw materials to the manufacturers and such other important facilities that go to the priority industries. However, by this time the Government were so used to collect fabulous amounts of excise duty - as is shown in the chart below - that they found it extremely unpleasant to withdraw the heavy taxation which they have put on the industry with the result that the manufacturers and the consumers still groan under a heavy taxation to which this industry is subjected.

In spite of its trials and tribulations, the indigenous industry kept on growing and in 1965, five large manufacturing projects were started in the private sector. With the exception of automatic controls and some special alloy components, the industry finds itself completely self-sufficient upto any capacity. The momentum generated by the manufacturers, aided by the efforts of the Air Conditioning and Refrigeration Council of India, steam-rolled itself into a situation where few industries can claim to be in as far as self-sufficiency is concerned.

TECHNICAL PROBLEMS

The development as described above still does not solve the many-sided technical problems that come in the way of further development of this industry. The numerous technical institutions and colleges which exist in the country to-day hardly qualify young engineers to plunge into the field of air conditioning and refrigeration with any substantial knowledge at their back. The industry finds itself not quite well equipped to have training programmes which will produce rapid results. Thus, this growing industry is starved for good technical hands starting from the design engineer down to the workman who runs the machines. Most of the industries have their own training programmes but even these programmes do not generate enough talent to handle manufacturing as well as practical problems of the industry.

Furthermore, since the industry entirely depends on the technical know-how which is made available to the indigenous manufacturers from their foreign collaborators, its dependence on imported raw material retards its progress on account of severe foreign exchange shortage with which the country is continually faced. Efforts are being made to locate indigenous substitutes for certain raw materials such as copper, zinc etc., but nothing substantial has been achieved yet in this direction.

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The indigenous industry depends on foreign techniques and technical know-how which are totally based on their own conditions and those hardly suit the general conditions of operation and maintenance in this country. Lately, efforts are made to do some original designing in the manufacturing practice. The Government have recently constituted a Development Panel comprising of the Technical Development wing and various large manufacturers for the specific purpose of advising the Government about its policies towards this industry and to finding solutions to many technical problems as enumerated above.

COMMERCIAL PROBLEMS

The psychological barriers created in the initial stages still inhabit the minds of the consumers with the result that large volumes of imported equipment find its way into the country, thus giving a set back to the indigenous manufacturer. The blank licences granted by the Government for large scale industries cover air conditioning and refrigeration equipment as well which could be made available from local sources. The controls on the supply of raw materials to indigenous manufacturers continue to create a situation of short supply with the result that it is more or less a sellers market for the manufacturers. This factor alone inhibits the efforts to improve the quality of the product. The multi-point taxation and tax on top of tax makes the finished products price beyond the easy scope of the consumer.

The noted economist, Dr. V. K. R. V. Rao, who joined the Central Cabinet recently, sees a great hope in diverting our land resources from grain crops to tuber crops. The per capita consumption of potatoes per day in our country is only 20 gms. as against 217 gms. average in the world. This diversion to tuber crops, according to Dr. Rao, is the long-term solution of India's food problems.

Potatoes have to be preserved under controlled temperature and humidity and this alone proves the enviable role this industry has to play in the coming years. The significant point to note is that while preserving the tuber crops from rotting, refrigeration at the same time fulfils some of the national ambitions such as in helping to boost the income of the farmers. In the absence of cold storages the farmer had to sell his bumper crop at a low price, but to-day he is in a bargaining position. At present 659 cold storages have their agents procuring potatoes for filling up their cold storages. Only ten years ago, the farmer had to be content with Rs. 4 per md. but to-day he is in a position to get Rs. 20 per md. in view of the heavy demand from the cold storages.

Here is a Paradox of a situation where the private cold storage owners were developing the cold storages at a time when the Government were least conscious of either the role of cold storages in the preservation of foodstuffs or of helping the economy of the farmer. Unfortunately, when the Government is awakened to this situation, they have been misguided by a recent report of the Estimates Committee of the Parliament who have alleged that the private cold storages have contributed to the inflationary trend of the food in the country and as such the State Governments should be cautious against granting cold storage licences to private parties. They, however, recommend that only Government or Co-operative institutions should be encouraged to set up such facilities for the preservation of food. This indeed is a very unfortunate development towards the development of cold storages in the country.

There is another paradox of an interesting nature. In order to encourage scientific handling of milk in the country, the dairy machinery is exempt from the customs duty. But since the nomenclature says dairy machinery and

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makes no mention of the refrigeration equipment that goes in it, only the pasteurizer and other purely dairy equipment, enjoys such a privilege inspite of the fact that refrigeration equipment is a part of the dairy equipment.

As some of the technologists put it, milk can be kept without pasteurization but cannot be

kept without the refrigeration equipment. This is a paradox of two vital parts of the same projectone suffering from a penalising excise duty and sales tax and the other exempt even from the customs duty.

The solution of these problems will solve the very urgent national problems.

Excise Duty and Special Excise Duty — Refrigeration & Airconditioning Machinery of All Sorts

	<u>Excise Duty</u> amounts realised	<u>Spl. Excise Duty *</u> amounts realised
	RS.	RS.
1960—61	1,71,000	—
1961—62	91,43,000	—
1962—63	1,45,82,000	41,87,000
1963—64	1,36,68,000	45,00,000 approx.
1964—65	2,28,42,000	76,00,000 ,,
1965—66	2,57,82,000	85,00,000 ,,
1966—67	1,14,73,000 †	22,78,000 ‡

* Special Duty levied from 1-3-63 @ 33-1/3 of basic duty.

† For six months only — April to September, 1966

‡ For four months only — April to July, 1966.

Quick Transport of Fish Within the Country

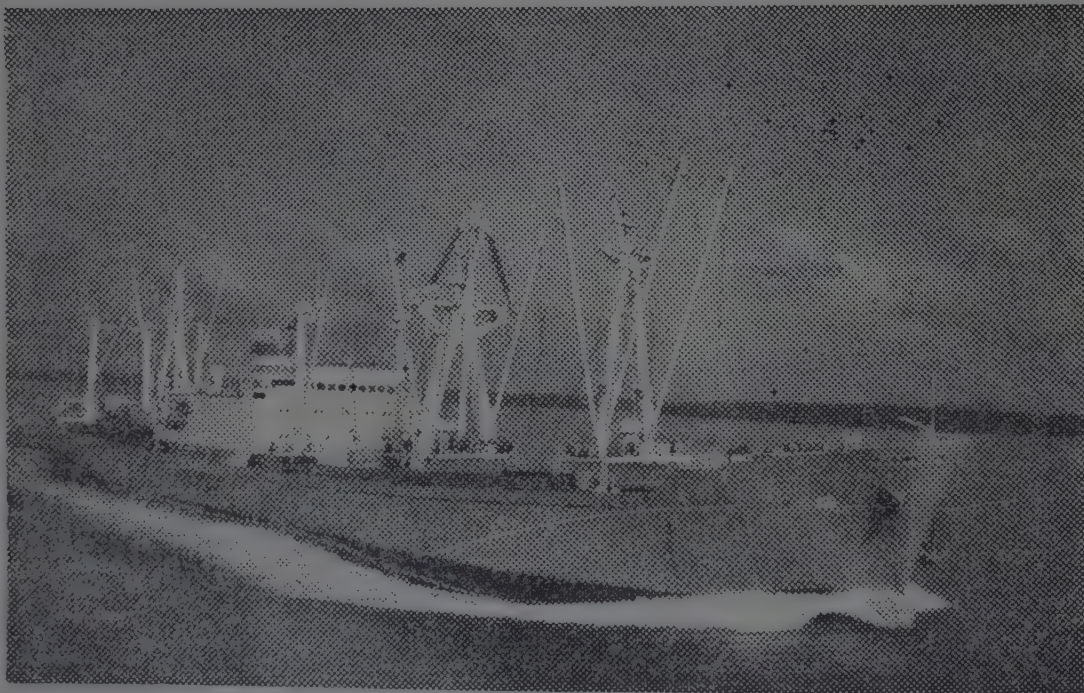
Suggestion to Employ Carrier Aircrafts

Prof M. S. Thacker, Member, Planning Commission, has emphasised the need for quick transportation of fish and fish products from southern coasts of Indian Ocean and Arabian Sea to the consuming centres of Bengal, Bihar and Orissa.

Addressing the 24th Meeting of the All India Food Preservers' Association held at Hyderabad Prof. Thacker said carrier aircrafts could usefully be employed for this purpose.

How far this project could be made workable and profitable should be discussed with the Ministry of Food, he said.

He revealed that fish, which was in abundance in Kerala Coast, was also being used as fertilizer. The ration of non-vegetarians in the north could be cut down by supplementing fish and fish products. He commended this matter to the Food Ministry's attention.



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EXTRACTION OF SHARK FIN RAYS

Dried shark fin is a valuable product of export from India. Export of the fins together with fish maws has been of the order of 32,1200 kg. per year, based on the figures for the past 3 years upto 1965, bringing forth nearly Rs. 26,55,200 in foreign exchange. A major part of the export takes place from Bombay although fins are processed in almost all the maritime states of India. Though fins from several varieties of shark are exported, those from 'RANJA' (*Rhynchobatus djiddensis*) fetches the maximum price. Fins from 'Pisori' (*Scolidon walbheemi*) Khada (*Carcharinus melanopterus*) and Kanar (*Zygaena malleus*) are some of the other varieties exported.

Details of the method of processing shark fins have already been reported. (Fish Technology Newsletter, Volume IV No. 4, January 1964).

From India the fins are exported mainly to Singapore and Hongkong. It is the shark fin ray and the gelatinous part that are mainly utilized in the importing countries. They are utilized for the preparation of soup.

If fin rays are exported instead of the fins, it is possible that they may fetch a better price since the fin rays can be readily made use of for the preparations. Attempt made at this Institute has been successful in developing a method for extraction of the fin rays. The methods are economic and do not require any elaborate machinery or equipment and at the

same time can give a product of good quality. The details are given below :

METHOD OF EXTRACTION OF SHARK FIN RAYS

Method-1

1. Soak the died shark fins in water acidified to pH 2.5 to 5 preferably with acetic acid or with hydrochloric acid for 5-6 days so as to hydrolyse the collagen in the fins to gelatin.
2. When the muscle and skin on the fins get sufficiently softened, cut off the rays from the base and separate the cartilage by a knife. (A sharp bamboo knife can be used).

In cases where the muscle and skin do not get softened even on soaking for 5 to 6 days in acidic water (as in the case of shark fins stored for more than a year where the rehydration capacity is less) the soaked fins may be treated in hot water at 75°C for 20 to 30 minutes when the rays would separate.

3. Clean the rays of all adhering muscle, fibre etc. by scraping the rays with the knife and washing in plain water.
4. Dry the extracted fin rays in the sun or preferably in an artificial dryer at 35°C to 45°C to a moisture content of 5 to 8%.

5. Store the dried rays in polythene lined gunny bags. Such fins will keep in good condition for more than a year without any significant change.

The rays obtained in the above method are colourless to light yellow, lustrous and almost of the same length as the fins. The yield of rays varies from 8% to 21% depending on the variety of the shark fins used.

Method-2

Another method worked out at the Institute for extraction of shark fin rays consists in cooking the dried fins in mild acidic water (acidified with acetic acid) till the collagen is hydrolysed to gelatin and the rays are exposed. The rays are then picked up, cleaned free of adhering muscle etc. washed well and dried.

From black varieties of shark fins, the rays obtained are generally coloured pale yellow. But if enough care is exercised in removing the

epidermis (by scraping off by a bamboo knife) and washing well in water, the intensity of colour can be reduced and almost colourless rays are obtained.

Note-1 The residual muscle left behind after removing the fin rays can be boiled with water containing acetic acid for 4 to 8 hours for extraction of the glue. After boiling, the glue can be separated by filtration or centrifugation. The glue can be further evaporated to the desired consistency which can be preserved without any fungus growth by using phenol as a preservative.

- 2 If enough care is exercised while removing the fin rays the cartilage can be recovered in lengths of 7 to 9 cm. The pieces are then cleaned of adhering muscle, washed well and dried.

—*Fish Technology News Letter*
Vol. VII. No. 4.

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NEWS & NOTES

Delegations to Foreign Countries

The Marine Products Export Promotion Council has, it is understood, decided to send the following members to attend the Annual Session of the International Shrimp Council Meeting to be held in Mexico City in June this year :

Shri V. M. Srikumaran Nayar,
Chairman, Marine Products Export
Promotion Council and Director of the
International Shrimp Council

Shri Kurwath Damodaran,
Vice-Chairman, Marine Products
Export Promotion Council,

Shri N. C. Koli,
Managing Director,
Maharashtra Rajya Machimar
Sahakari Sangh Limited, Bombay

Members,
Indian
Seafood
Exporters
Association.

Shri R. Madhavan Nair,
Managing Director,
M/s. Cochin Company (P) Ltd.,

Shri Y. M. Elias,
Director, Indo-Marine Agencies
(Kerala) P. Ltd.,

and

Dr. A. N. Bose,
Director,
Central Institute of Fisheries Technology
and Chief of Quality Control Inspection
Scheme.

* U.S. Shrimp Imports Hit New High in 1966

Total shrimp imports for 1966 were 193 million pounds, heads-off weight. The increase last year was in line with the average annual increase of 10 percent since 1950. About 60 countries shipped shrimp to the United States in 1966; only 17 countries exported to the U. S. in 1950.

A substantial portion of the increase in imports came from Mexico. Mexican shrimp landings had declined since 1961, and 1965 production was off about a fourth from previous years. In 1966 catches were closer to their previous levels.

Imports from Asia continued to grow in 1966. Since 1963 Asia has supplied more shrimp

Delegation to Australia

In view of the serious situation created by the introduction of Bacteriological standards by Australia, the Marine Products Export Promotion Council has decided to send a Delegation to Australia to study the implications of the restrictions. The following persons were elected to constitute the delegation :

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to the U. S. market than the South American Continent. Last year Asia supplied 28 percent of all United States imports, up from 25 percent in 1965. India continued to be the largest shrimp supplier from Asia. In 1966 Iran became a major factor in the world shrimp market and surpassed Pakistan as the number two Asian supplier to the U. S. Kuwait shipped slightly less to the U. S. in 1966.

With the exception of Panama (down 5 percent), the Central American countries, including Mexico made substantial increases in their shipments to the U. S.

Shipments from South America dropped sharply in 1966 because shrimping was poor in Venezuela, which shipped 10 million pounds less to the U. S. than in 1965. Shipments from Ecuador dropped about 8 percent. Other South American countries exported larger quantities to the U. S. but were not able to offset the Venezuelan decline.

Imports from U. S. S. R. were 1.1 million pounds (product weight) compared with 33,000 pounds in 1965.

*** Japan To Buy More Shrimp from Pakistan**

A team from Japan, including the Ministry of International Trade and Industry, will go to Pakistan to study ways to promote the purchase of primary products in order to overcome present imbalance of trade with Japan. Shrimp will receive considerable attention. In 1965 Japan purchased 206 metric tons of shrimp from Pakistan valued at about \$354,000. In the first six months of 1966 the purchases amounted to \$ 233,000.

*** Japanese Shrimp Imports Set Record High**

Japanese imports of frozen shrimp in 1966 set a record high of 36, 156 metric tons valued at \$ 60.08 million. Imports increased 72.8 percent in quantity and 67.1 percent in value over 1965 and accounted for about 40 percent of the total value of fishery products imported by Japan in 1966. The tremendous increase in shrimp imports by Japan is attributed primarily to growing consumer demand brought about by increased earnings of Japanese families.

*** Russia Discovers New Shrimp Resources**

The Russian research vessel KALMAR returned to Vladivostok from a 4 month trip in the north western Bering Sea where it discovered extensive shrimp resources in the Gulf of Anadyr. This is said to be one of the most significant discoveries by Soviet fishery scientists in recent years. Officials of the Far Eastern Fisheries Administration plan to send a shrimp fleet this year to explore the resources.

*** Greek Fleet to Shrimp in Arabian Gulf**

In September the Greek Atlantic fleet of freezer trawlers had 33 vessels in operation and another 3 were preparing for shrimp fishing in the Arabian Gulf. The Greek Government is formulating plans for the establishment of fishing jetties and refrigerated storage facilities in Piraeus, Thessaloniki, Cavalia, and Chalkis.

* Source-Shrimp Abstracts

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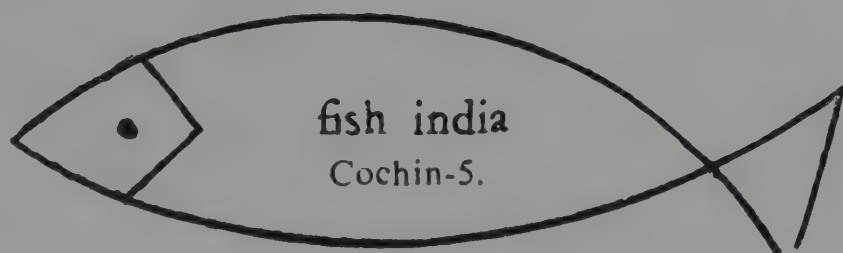
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SEAFOOD EXPORTER

Vol. 1

*

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Editorial

THE importance of the part played by research in guiding any industry and helping it to achieve progress can never be over-rated. The Seafood industry with its numerous technological problems from catching to consumption is no exception to this rule. Realising the importance of these problems and the need to solve them, it is gratifying to note that the Government of India has established a number of institutions to study various aspects of Fisheries and the mysteries of the vast oceans that surround the country. The Central Institute of Fisheries Technology, Ernakulam, the Central Marine Fisheries Research Institute, Mandapam Camp – which incidentally celebrated its 20th anniversary recently, — the Central Food Technological Research Institute, Mysore, the Indian Ocean Biological Centre, Indian Ocean Physical Oceanographic Centre etc. are some of these establishments. The activities of these and other institutions have proved to be of immense help in the development of fisheries and allied industries on modern lines. Though the country is still backward as far as fishing etc. is concerned, these developmental activities have helped to earn for India's products a name and fame in foreign countries. It is freely admitted that India's Seafood industry has a bright and prosperous future and, therefore, researches directed towards developing it on most modern lines and placing it on a firm footing must necessarily play an increasingly important role. However, it has to be admitted that the valuable data and results obtained in the past in that direction have not yet been fully availed of by the industry. Lack of propaganda,

inadequate facilities and shortage of trained personnel could very well be some of the reasons for this. As time goes on, we have no doubt that the industry will take full advantage of the valuable know-how and methods evolved by these institutions and benefit by them.

How could the Seafood industry benefit by these findings? We might commend for instance the method recently perfected by the Central Institute of Fisheries Technology, Ernakulam, for cutting forelegs. We are not unmindful of the controversy that has developed between the Frog-legs Exporters on the one hand and the Society for Prevention of Cruelty to Animals and such other agencies on the other regarding the methods of catching frogs and cutting their legs for processing purposes, resulting in interference with the activities of Frog-legs Exporters. There is no denying the fact that the methods adopted by the exporting houses were unscientific and cruelty to some extent. On the other hand the system perfected by the Central Institute of Fisheries Technology eliminates cruelty and makes cutting easier and painless. It is indeed an achievement which should end the controversy raging for sometime now and, therefore, we offer our hearty congratulations to the Institute on its valuable services and achievement in that direction.

We trust these institutions will continue their pioneering and ceaseless efforts at unravelling the mysteries of the Ocean and developing valuable and most up-to-date Fisheries techniques designed to help in building up the Seafood and allied industries which admittedly are designed to play by no means an unimportant role in the country's economic growth.

SOVIET FISHERIES IN THE COMING FIVE YEARS

Alexander Ishkov
USSR Minister for Fisheries

In the present Five-Year Plan, the catch-target is 8.5–9.0 million tons of fish, whales, crabs, shrimps and other marine animals. The average annual growth rate for the general catch is to come to 12 per cent and for fish to 14.7 per cent. Thus it will be possible to increase by 1970 the per capita fish consumption to 20 kilogrammes, as compared with 12.5 kg in 1965.

New Fishing Areas

The Soviet Union will be able to get in the five years 9 million tons of fish by developing fishing in open seas and oceans. Soviet research vessels are now exploring new fishing areas in the Indian ocean and in the northern part of the Pacific.

In the course of five years the number of fishing vessels is to be increased by approximately two and a half times. That means that the USSR will get hundreds of large fishing and refrigerator vessels fitted with the latest equipment. The construction of new sea-borne fish canneries, including such that will deliver the fishing vessels to the fishing area, will be carried out. The first base of this series of vessels will bear the name of "Vostok".

Mechanized Production

Major attention is also paid to automating and mechanising production processes, beginning from fish reconnaissance and up to the processing stage. It is intended to introduce on a large scale the so-called continuous trawling method. With this method, the trawl is not pulled up on board ship every time. Highly sensitive devices and instruments watch what is taking place under the water: how the trawl goes down and how it fills up.

Seventy-five fish-breeding enterprises are now operating in the areas of main fishing basins. They breed young sturgeon salmon and sig fishes. The spawning and breeding economies breed bream, sazan, pipe perch, Caspian and sea roach. These enterprises put into the country's water bodies about 10,000 million young commercial fish every year. The coming five years will see the construction and reconstruction of 48 fish-breeding enterprises. Five years from now the output of young commercial fish will have doubled.

We attach major importance to the acclimatization of commercial fish species. This work is conducted by special stations. Eleven of these were set up in the USSR in the recent years. Artificial ponds are an important reserve of fisheries. By 1970 they will produce 150,000 tons of fish.

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Sangh strides to raise Fishermen's economy through co-operation

A METHOD FOR CUTTING OF FROG LEGS

An easy and humane method of cutting live-frogs to obtain the legs for freezing or for processing by any other method has been developed at the Central Institute of Fisheries Technology. The method not only ensures painless cutting of legs from live frogs but also significantly reduces chances of bacteriological contamination of the prepared legs.

The method of obtaining the frog-legs, now generally followed is cutting of the hind legs of live-frogs with a knife, without rendering the animal insensitive to the operation. Pitiably croaking of the frogs, struggling of the animal pulsating dismembered limbs, all create an atmosphere which to say the least is revolting and the operation has been rightly objected to by the societies engaged in prevention of cruelty to animals as also generally by the people for ethical reasons. But a simple, cheap but effective method of anaesthetizing was not found. Various methods like use of anaesthetic chemicals, electroculation etc. were tried but were discarded as they were too costly or too sophisticated or not suitable for practical application. The present method developed by Central Institute of Fisheries Technology is simple, can be easily applied, is cheap and effective.

The method developed by Central Institute of Fisheries Technology consists simply of putting the live-frogs in solution of common salt (10% Sodium Chloride) for 10 minutes.

The new method has the following advantages over the traditional method of cutting.

- a) It paralyses the frogs and relieves it from pain during cutting.
- b) Bacteriological quality of raw and frozen frog legs is far more superior and the material is practically free from faecal bacteria while frog legs cut under traditional method is heavily contaminated. (Table I and II). Generally skin of frog legs, apart from broken viscera contain very high bacterial load (Table III) particularly *E. coli*. Treatment in brine solution will remove the surface slime containing the bacteria. An additional washing in chlorine water will remove the bacteria coming from the broken viscera or from contamination during cutting or handling.
- c) Storage life under ice, is about 24 hours more than that of the frog-legs produced by traditional procedure.
- d) Colour is comparatively better than that of legs produced at present.

By the use of this method, practice of cutting the frogs in interior villages can be stopped completely and cutting can be organised in much more hygienic way in processing centres as in towns and municipal areas where supply of good quality potable water will be easier. Quality of the product, now processed, is not only affected by scarcity of ice but also invariably by the use of polluted water.

TABLE - I

EFFECT OF SALT TREATMENT ON BACTERIAL COUNT OF RAW AND FROZEN FROG-LEGS

SKIN OF FROGS						RAW MATERIAL						AFTER FREEZING					
Before treatment						After treatment with salt						Bacterial count immediately after cutting					
A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
5.1×10^8	530	17000	3.1×10^3	Nil	Nil	6.1×10^4	Nil	Nil	8.1×10^5	360	3200	1.3×10^5	Nil	Nil	1.9×10^5	110	980
3.0×10^6	1500	20000	2.6×10^3	Nil	Nil	3.1×10^4	Nil	Nil	8.6×10^5	800	1500	3.0×10^5	Nil	Nil	6.9×10^5	230	1000
2.8×10^6	400	28000	7.1×10^2	Nil	Nil	5.1×10^5	Nil	Nil	6.9×10^5	700	3200	3.1×10^5	Nil	Nil	4.8×10^5	330	980
6.0×10^6	1900	60000	1.1×10^2	Nil	Nil	5.3×10^5	Nil	Nil	6.8×10^5	650	980	6.8×10^5	Nil	Nil	3.9×10^5	190	300
2.5×10^5	2000	40000	2.1×10^3	Nil	Nil	6.1×10^5	Nil	Nil	9.3×10^5	120	900	3.2×10^4	Nil	Nil	3.8×10^5	90	490
2.6×10^6	1800	29000	6.1×10^2	Nil	Nil	6.8×10^5	Nil	Nil	8.6×10^5	110	1100	1.1×10^5	Nil	Nil	6.1×10^5	68	600

A : Total count per sq. cm.

A₃ Total count per gr.

B : Faecal streptococci per sq. cm.

B : Faecal streptococci per gr.

C : E. coli per sq. cm.

C : E. coli

TABLE - II

BACTERIAL COUNT OF RAW AND FROZEN FROG LEGS
(Processed under commercial conditions)

RAW MATERIAL			FROZEN MATERIAL		
Total count per gr.	Faecal streptococci per gr.	E. coli per gr.	Total count per gr.	Faecal streptococci per gr.	E. coli per gr.
5.66×10^6	3466	66500	5.11×10^5	1690	12600
1.61×10^6	15466	83853	3.92×10^6	1600	12000
3.72×10^7	21735	6400	3.42×10^6	1990	13110
2.58×10^7	475	10600	4.45×10^6	3260	14100
2.80×10^6	25330	75800	6.90×10^6	4990	12110
3.33×10^6	26000	69190	3.15×10^6	3760	11690
8.55×10^6	13260	29760	2.16×10^6	4001	12100

TABLE - III

BACTERIAL LOAD ASSOCIATED WITH THE SKIN OF LIVE FROGS

Total count per sq. cm.	Faecal streptococci per sq. cm.	E. coli per sq. cm.
5.1×10^6	530	17,000
3.0×10^6	1500	20,000
2.8×10^6	400	28,000
6.0×10^6	1900	60,000
2.5×10^5	2000	40,000
2.6×10^6	1800	29,000

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PRAWN FISHERIES

K. H. MOHAMED

THE most outstanding development that has taken place during the past decade in India's fishing industry is the phenomenal increase of prawn export brought about chiefly by the introduction of modern processing methods. The insatiable demand for prawns from the United States and other foreign countries has been the incentive for most of the entrepreneurs to establish up-to-date processing plants for packing prawns. As a direct consequence of the high demand for raw material and due to the timely help and advice rendered by the various research and other organisations of the Government of India, a number of mechanised fishing vessels were introduced into the capture fisheries for prawns. While these developments had their effect in the fishing industry all over the country it is to be admitted that maximum development has taken place in the south-west coast of India from where more than 80% of the exportable varieties of prawn are now being landed.

Trend of Production

According to the latest estimates average annual marine prawn landings of the country amount to 77,461 tonnes and it accounts for over 10% of the total catches. In addition to these quite a substantial quantity of prawns are landed from the backwaters, lakes and estuaries on the east and west coast of India.

Table I. Prawn landings and their percentages among crustaceans and overall marine fish landings of the country

Year	Prawn landings in tonnes	Percentage in total crustacean landings	Percentage in total marine landings
1958	85,191	98.26	11.27
1959	65,436	96.90	11.19
1960	68,029	96.36	7.73
1961	62,768	96.85	9.18
1962	83,235	98.78	12.92
1963	81,593	97.54	12.45
1964	94,895	95.41	11.04
1965	78,544	97.08	9.64
Average	77,461	97.14	10.68

Although there are no reliable statistics, the landings from these sources are generally considered to be as high as half the quantity of marine landings. The trend of marine prawn production indicates (Table I) that the catches remained more or less steady over a number of years and its proportion in the catches fluctuated between 12.92 to 7.73% during the period of 8 years. Although prawns are landed from all the maritime states of India more than 89% of the total resources comes from the west coast; the states of Maharashtra and Kerala contributing to the bulk of the landings (Table-II)

Table II—Statewise Prawn landings and their percentages
(Average of 8 years)

State	Average prawn landings in tonnes	Percentage
West Bengal & Orissa	1,843	2.39
Andhra	3,426	4.45
Madras	2,625	3.41
Kerala	20,444	26.55
Mysore	950	1.23
Goa	123	0.16
Maharashtra	40,605	52.73
Gujarat	6,983	9.07
Andamans	1	...

The Fishery

The fishing methods employed in the capture of prawns from all over India have been described by various workers. The only new method that has come into practice in recent times is the trawling by mechanised fishing vessels. Most of these vessels are 7 to 11 m long and are powered by 10 to 45 h. p. engines. They carry out daily fishing operations using ordinary cotton 2-4 seam shrimp trawls of 15 m head rope having a mesh size of 2 to 3 cm. A few large and well equipped trawlers capable of staying out in the sea are also operating from Cochin. The chief source of prawn landings is still the indigenous gear operated from dug-outs and canoes; the catches from the stake nets of Gujarat and Maharashtra and the boat seines of Mysore and Kerala even now forming the bulk.

The operations of the mechanised vessels have, however, extended the area of fishing into slightly deeper waters and have helped to keep up a steady supply of exportable varieties of Prawns. The present commercially exploited prawn fishing grounds lie within 40 m depth on the west coast. From the overall pattern of

distribution of prawns it is seen that they are generally more predominant off the bar mouth of lakes and estuaries possibly because the discharge by the rivers would help to create the loose muddy sea bottom on which these animals abound. In spite of the indications that large prawns are likely to be more in the deeper waters attempts are not so far made to fish such areas partly because these areas are not adequately surveyed and also due to the uncertainty of the economic aspects of such trial ventures by the industry.

Catch Composition

India's marine prawn catch can be divided into two broad categories—the penaeid and non-penaeid—each of them contributing to nearly half the total landings. The penaeid prawns are relatively large sized and are represented in the commercial catches by about a dozen species, chief among them being *Penaeus indicus*, *Metapenaeus dobsoni*, *M. affinis*, *M. monoceros*, *M. brevicornis*, *Para-penaeopsis stylifera*, *P. sculptilis* and *Solenocera indicus* while the latter category consists of a few species of small sized prawns viz., *Palaemon tenuipes*, *P. styliferus*, *Hippolysmata ensirostris*, *Acetes* spp. From the point of view of the export industry the former category is of utmost importance as virtually all the prawns exported from the country belong to this category. The catches from Gujarat and Maharashtra areas mostly consist of the non-penaeid prawns while those from Mysore, Kerala and Madras are the large sized penaeid prawns. Details regarding their size, seasonal occurrence, gear employed in capture and approximate proportion in the commercial fisheries are given in Table III.

Fishing Season

The prawn fishery is seasonal, but the seasons vary from place to place. Generally speaking, the fishing season for prawns extends from November to May in the west coast and from December to August in the east coast; in both cases interruption of the season being

brought out by monsoon, the success or failure of which is believed to have influence over the fishery. In the Gulf of Kutch there is a monsoon fishery for prawns and so also in Kerala where the formation of mud banks in close inshore waters in June-July support a flourishing prawn fishery in some of the areas. The turbulent conditions of the sea and the stormy weather that are prevalent during monsoon render it difficult for the fishing vessels to successfully operate during this season. A few trawlers that are working from Cochin at present brave the rigours of monsoon and carry out fishing operations during this period. Their operations have shown that successful prawn fishing could be carried out even during monsoon.

Processing and Export

Some portions of the prawn catches are marketed in fresh condition. The long prevalent methods of processing such as simple sun-drying, extracting pulp by boiling and drying, semi-drying, etc., are still in vogue. At present the modern processing methods like freezing, canning, pickling, etc., claim better part of the large sized prawns landed in the country. Simultaneous with the increase in export of the sophisticated products like frozen and canned prawns that of the dried prawns have come down considerably. In 1966 a total quantity of 11,470.014 tonnes of prawns and prawn products valued at Rs. 112,719,139 were exported from India. This included a variety of products like frozen prawns, canned prawns, dried prawns, prawn powder, prawn meal, prawn pickle, prawn curry, etc., and were exported to over 50 countries of the world. Most of these products now pass through a strict quality control by the Government and are well accepted in the world markets.

Different methods of freezing and packing are in practice. The prawns are first beheaded and deveined before they are graded according to size. The larger grades are frozen with shell

on in suitable cartons while the smaller grades are peeled and the meat is either frozen direct or cooked and frozen. After freezing the packed cartons are stored in cold storages until they are shipped. Generally smaller grades of prawns are used for canning. The raw material is shelled and deveined at the production centres and when it comes to the factory it is already in the meat form well iced. The meat is then cleaned, graded and filled in cans containing brine. It is then cooked, seamed and subjected to the necessary canning procedures.

Biology of Prawn

Almost all the penaeid prawns breed in the sea and their young ones enter the estuaries and backwaters when they are in post-larval stages. The only known exception to this is *P. Stylifera* which, however, completes its life cycle in the sea itself without entering the estuarine environment during any stage of its life cycle. The question why these juvenile prawns enter the estuaries is not fully understood yet. The physical and chemical factors such as temperature, currents, tides, salinity, nutrients, etc., of the environment or the characteristics of the life cycle themselves may be responsible for these movements. The juvenile prawns that enter the estuaries feed and grow there upto a particular stage and return to the sea where they attain sexual maturity. In the trawling grounds these prawns show seaward and shoreward movements in different seasons and these movements are either sex oriented or size oriented. Investigations carried out by the Central Marine Fisheries Research Institute show that *M. dobsoni* and *P. stylifera* breed in 20-22 m depth regions and *M. monoceros* in 50-60 m regions. Although conclusive evidence is not available in respect of *P. indicus* and *M. affinis* indications are that these two species breed in still deeper waters. It is estimated that these prawns breed five times during their life time and that the interval between two successive breedings is about two months. The prawns fished from the backwaters are generally 4 to 10 months old while those fished from the

Table III Particulars regarding

Name of Species	Vernacular names	Area of occurrence as Commercial fishery	Season of fishery
1	2	3	4
Penaeid Prawns			
<i>Penaeus indicus</i>	'Naran Chemmeen'	West coast & East Coast	December to February
<i>Penaeus monodon</i>	'Kara Chemmeen' 'Bagda Chingiri'	West Coast & East Coast	Throughout the fishing season
<i>Metapenaeus dobsoni</i>	'Poovalan' 'Thelly Chemmeen' 'Chingiri'	South-West Coast & East Coast	October to June
<i>Metapenaeus affinis</i>	'Kazhandan Chemmeen' 'Jinga'	West Coast & East Coast	Nov.-Dec. & May-June
<i>Metapenaeus monoceros</i>	'Choodan Chemmeen' 'Jinga' 'Koraney Chingiri'	West Coast & East Coast	Nov.-Dec.
<i>Metapenaeus brevicornis</i>	'Dhanbone' 'Chingiri' 'Jinga'	W. Bengal Andhra Maharashtra Gujarat	Feb.-March
<i>Parapenaeopsis styliфера</i>	'Karikadi Chemmeen'	West Coast	Sept.-Oct. & May-June

the commercial prawns of India

Principal Fishing gear employed in capture	Approximate representation in the annual catch	Maximum size total length mm.	Majority size in the catches mm.	Remarks
5	6	7	8	9
Shrimp trawl	10.0%	220	136-145	Juveniles fished from lakes, backwaters and estuaries as commercial fishery
Boat seine				
Cast nets				
„	0.9%	250	170-180	Largest of the marine prawns
„	35.0%	130	86-95	Juveniles fished from lakes, backwaters and estuaries as commercial fishery
„	12.0%	180	121-130	Juveniles poorly represented in the back-water catches
„	10.0%	190	126-135	Juveniles fished from backwaters in significant quantities.
Stake nets	4.0%	135	101-110	Ascends the tidal rivers in Bengal
Seines				
Stake nets	18.0%	142	81-90	Purely marine species
Trawl nets				
Boat seines				

1	2	3	4
<i>Parapenaeopsis sculptilis</i>	'Jinga'	Gujarat Maharashtra Andhra	Dec.-March
<i>Parapenaeopsis hardwickii</i>	'Jinga'	Gujarat Maharashtra Andhra	Nov.-Feb.
<i>Solenocera indicus</i>	'Jinga'	Maharashtra Andhra	Jan.-May
Non-Penaeid Prawns			
<i>Palaemon tenuipes</i>	'Kolbi'	Gujarat Maharashtra Orissa West Bengal	Dec.-Feb.
<i>Palaemon styliferus</i>	'Kolbi'	Maharashtra West Bengal	All round the year
<i>Hippolysmata ensirostris</i>	'Kolbi'	Gujarat Maharashtra Andhra	Sept.-Nov.
<i>Acetes spp.</i>	'Kardi'	West Coast & East Coast	Dec.-March
<i>Macrobrachium rosenbergii</i>	'Konchu' 'Golda Chingiri'	Fresh water rivers of India	May-Nov. in Kerala

5	6	7	8
Stake nets Trawl nets Boat seines	0.8%	152	76-85
Stake nets Trawl nets Boat seines	0.6%	130	81-90
Stake nets Boat seines	0.9%	125	76-85
Stake nets Boat seines	3.0%	74	45-50
Stake nets Seines	0.6%	100	51-60
Stake nets Boat seines	0.9%	90	66-75
Stake nets Boat seines	3.0%	25	16-20
Traps, Cast net hooks & lines	—	310	200-250

sea mostly belong to late O-year and 1-year groups.

It is interesting to report here that during some of the research cruises in 1965 it was found that a few species of deep water prawns (*Aristaeus semidentatus*, *Heterocarpus woodmasoni*, *H. gibbosus*, *Parandalus spinipes*, *Penaeopsis rectacuta*, *Metopenaeopsis andamanensis* and *Plesionika martia*) were present in considerable quantities in deeper waters of 300 to 340 m off the south-west coast of India. Some of these species appear to have Commercial possibilities and it is likely that we may be able to exploit this resource in due course.

Future Work

The life history of the prawns and their movements are only partly understood at present. Reliable data on the various biological aspects of the individual constituents of the fishery are essential for planned development and rational exploitation of the resources. While the introduction of mechanised boats has resulted in maintaining a steady supply of raw material for the export industry no appreciable

increase in overall landings has been evident. This situation has to be very carefully studied and management policies framed, if found necessary at appropriate time. The fast rate of development that is taking place in the industry calls for finding out additional resources to increase the catch. The potentialities of the east coast grounds are not fully known and remain to be studied. A detailed survey of the grounds lying off the river mouths in the east coast may prove fruitful. Possibilities of exploiting recently observed resources of deep water prawns on the continental slope of the south-west coast have to be fully explored. Culturing of prawns in estuarine waters, as is practised in some of the south-east Asian countries, is another aspect to be examined. The present attempts at culturing the fresh water prawn *M. rosenbergii*, if successful, will open up vast scope for widespread stocking of this species in the reservoirs. Transplanting of this species to other river systems where it is not known to occur is likely to yield good results.

—20th Anniversary Souvenir Centenary
Marine Fisheries Research Institute

SEAFOOD EXPORTER

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EXPORT OF INDIAN FROG LEGS

With an earning of Rs. 4.74 lakhs in 1959, exports of Indian Frog legs reached a figure of Rs. 38 lakhs in 1965-66. United States of America topped the list by contributing to 73% of the earning, with France running a close second.

Playing an important part in the treatment of T. B., Asthma, etc., frog legs are stated to possess curative qualities for infantile diseases also. No wonder, therefore, frog legs are being extensively experimented upon and used for research work.

In India today Kerala, Madras and Maharashtra are the main sources of supply and Cochin and Bombay factories have facilities for processing these. Though Indian froglegs enjoy a high reputation abroad, competition is now being experienced from Yugoslavia, China and Japan. In France our frog legs have to compete with the indigenous product.

With a view to preventing indiscriminate destruction of frogs and facilitating their large-

scale breeding, the Govt. of India has, during the last three years, been prohibiting the export of frog legs during the breeding season. The current ban expires on August 15.

Even so, a section of the exportes have suggested that instead of banning the exports during a specific part of the year, catching, killing or processing of frogs should be prohibited during the breeding season and that Quality Control authorities should strictly enforce the order by inspecting the plants as well.

Last year the Indian Council of Agriculture Research suggested a programme for frog-culture. The Kerala Govt. is now engaged in conducting research into frog-breeding.

The Marketing Research Corporation has put forward several proposals including the need for assessment of availability of frogs in the country and starting of frog-breeding centres.



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FISH ENSILAGE BY FERMENTATION METHOD

FISH if suitably incorporated, is a good source of protein in cattlefood also. It will enrich the diet making up the protein deficiency and also will add to the mineral and vitamin contents. Fish ensilage is a form of fish protein that can be incorporated in cattle foods. The method of preparation of the product has been reported earlier. (Fish Technology Newsletter, Vol. V, No. 1, April 1964). In the method an acid in required level is added to the minced meat for preservation. Further trials were carried out to improve upon the quality of the product and to find out the possibility of producing the acid required for preservation in the medium itself instead of adding it directly. It has now been observed that lactic acid produced by the fermentation of carbohydrates can be successfully used for the preparation of the product. The silage preserved by the lactic acid produced by fermentation is better in that the product is free from undesirable odour which it may have when prepared using mineral acids. Further, the product as such can be incorporated in cattlefood (without neutralization of the acidity as is to be done in the case of product produced by using formic acid or mineral acids).

Molasses (a waste product of sugar industry) is used as the source of carbohydrate. Lactic acid is produced from molasses by fermentation with a pure culture of *Lactobacillus plantarum* NCIB 6105; an active homofermenter producing lactic acid. The method worked

out for preparation of silage is briefly described below:-

Material

Any trash fish or fish unsuitable for direct human consumption. Nor-fatty fishes should be used since the presence of fish oil in the cattlefood is undesirable.

Preparation

1. Wash the fish thoroughly and mince well in a meat mincing machine.
2. Mix the minced meat with 10% by weight of molasses. Make the whole material into a slurry by adding about 30% by weight of water. Cook the whole mass for about 20 minutes and then cool to room temperature.
3. Take the mixture in a metal vessel coated inside with bitumen. (The bitumen coating is to resist the action of acid).
4. Add a pure culture (18-22 hrs. old) of *Lactobacillus plantarum* NCIB 6105. (Add the culture in the proportion of 5 ml. per 10 kg. of the material upto a maximum of 100 ml; thereafter the same quantity may be used for any quantity of the material). Stir well. Cover the vessel with a lid and then allow the fermentation to proceed at

room temperature stirring the product occasionally.

5. The product obtained after about 72 hours is fish ensilage which will be preserved by the lactic acid content at a pH of about 4.4.
6. When the digestion is over, distribute suitable lots of the product in well stoppered containers. The product keeps well for more than a year.

It has been observed that precooking of the minced meat mixed with molasses and water hastened the digestion and the product could be obtained within 72 hours. The uncooked material as well can be used and in that case it will take a little more time for the fermentation to result in the production of lactic acid required for the preservation of the slurry at a pH of about 4.5. The pH of the sample prepared from uncooked material within the same time (72 hrs) will be about 5 which is less for proper preservation.

The silage prepared from Jew fish was slight brown colour with fermented odour. The product at desired levels can be incorporated as such in cattlefood. The composition of a sample of silage prepared from Jew fish is given below. The analysis data clearly indicate that the product is a rich source of protein, minerals and vitamins.

Analytical Characteristics of Fish Ensilage from Jew Fish

Protein	...	12.13%
Minerals	...	3.17%
Lactic acid	...	4.84%
Ether extractives	...	2.65%
Vitamin B ₁₂	...	23.46 m μ
Thiamin	...	14.61 μ
Riboflavin	...	13.78 μ
Pantothenic acid	...	8.48 μ
pH of the sample	...	4.4

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NEWS & NOTES

The B. Sessler Co. New York

Mr. B. Sessler, Proprietor of this New York firm who visited India recently had discussions with M/s. Hazarat & Company, Cochin-2. M/s. B. Sessler & Co. are sole importers in U. S. A. for the seafood products of M/s. Hazarat & Co.

Mr. Sessler also laid the foundation stone of the new Freezing Plant proposed to be put up By M/s. Hazarat & Co., at their newly acquired site at Edacochin, Cochin - 6.



Mr. B. Sessler laying the foundation stone for the new freezing plant of M/s. Hazarat & Co., Cochin.



Mr. Sessler (in the centre) is seen with Mr. Bhot, Chief Agent, Central Bank of India Ltd., Cochin (first from right), Mr. Y. M. Ebrahim (second from right), Mr. P. V. Hazara (first from left) and Mr. P. V. Raghunath (second from left) after laying the foundation stone.

Canadian Trade Team in Ernakulam

An eight member Canadian Trade Delegation led by Mr. R. R. Loffmark, Minister for Industrial Development, Trade and Commerce, Government of British Columbia (Canada) was in Ernakulam recently. The delegation visited the Marine Products Export Promotion Council and had discussions with the Chairman of the Council and leading exporters of Marine Products on the possibility of exporting Marine Products to Canada. The delegation members also visited some of the seafood processing factories.

Members of the delegation were guests at a Dinner given in their honour under the joint auspices of the Marine Products Export Promotion Council and the Coir Board, on 29th April 67.

Enquiry on the working of the Fisheries Co-operatives in Kerala

The Government of Kerala has decided to hold a thorough enquiry into the working of the 500 odd Fisheries Co-operatives in the State, it was disclosed by the Fisheries Minister. The Minister stated that numerous complaints had been received regarding the Societies. The enquiry will be conducted by an officer of the status of the Deputy Registrar of Co-operative Societies.

Kerala Fisheries Corporation

The working of the Kerala Fisheries Corporation will also be the subject matter of an enquiry, according to the State Fisheries Minister, who stated that complaints had arisen regarding its working.

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